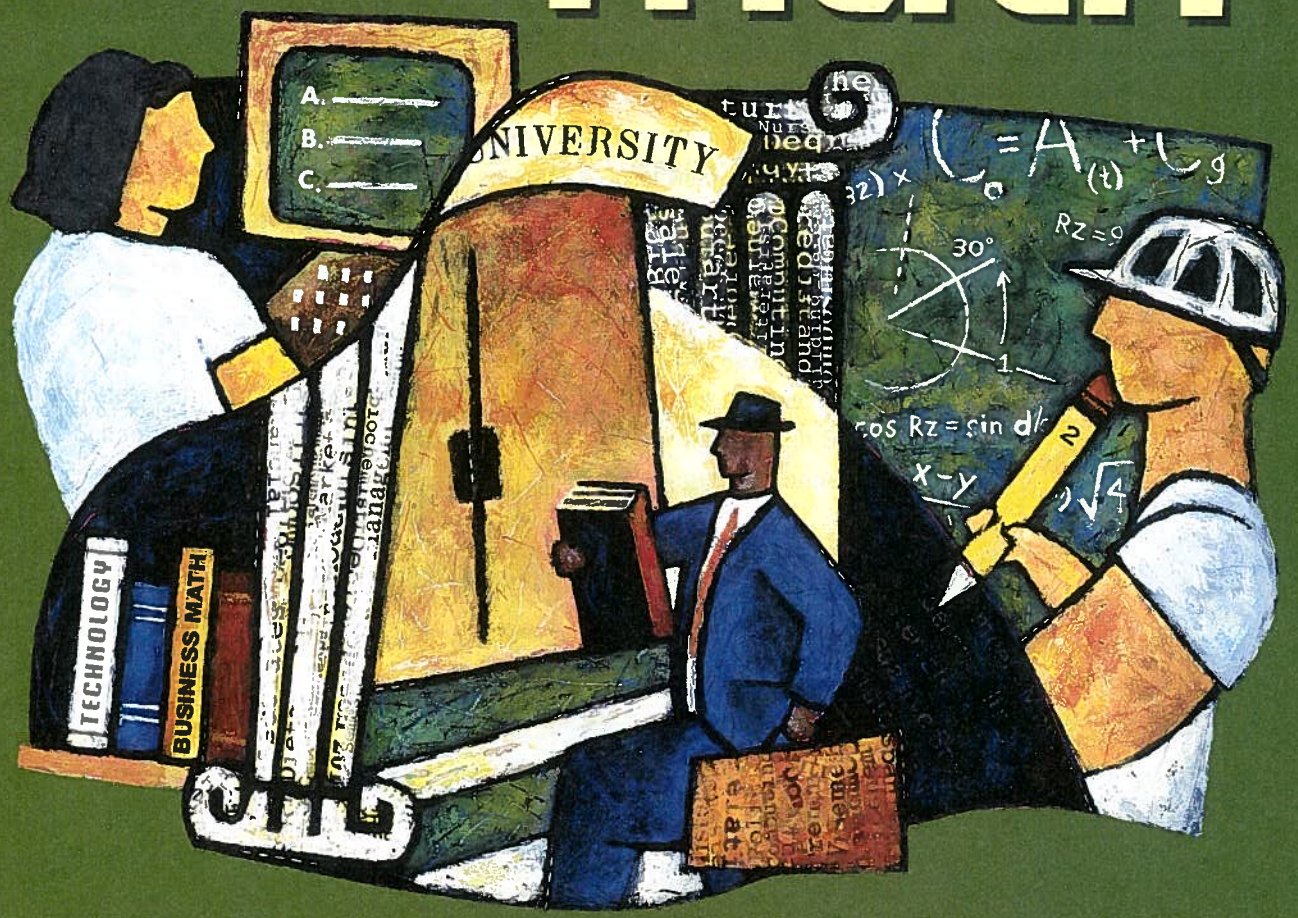
17th Edition

BUSINESS Math



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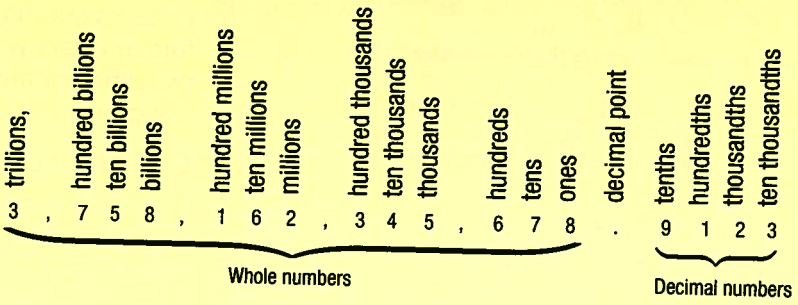
Skills Workshops

Skills Workshop 1

Place Value and Order

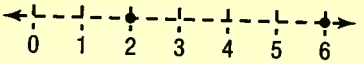
EXAMPLE 1 Write 3,758,162,345,678.9123 in words.



SOLUTION The number shown is three trillion, seven fifty-eight billion, one hundred sixty-two million, three hundred forty-five thousand, six hundred seventy-eight and nine thousand one hundred twenty-three ten-thousandths.

EXAMPLE 2 Use < or > to make this sentence true: 6 ■ 2

SOLUTION Numbers can be graphed on a number line. The number farther to the right is the greater number. Remember, < means "less than" and > means "greater than."



Six is greater than two. $6 > 2$

Write each number in words.

1. 3,647
2. 6,004,300.002
3. 0.9001
4. 17.049
5. 40,372
6. 6,071.435

Write each of the following as a number.

7. two million, one hundred fifty thousand, four hundred seventeen
8. five thousand, one hundred twenty and five hundred two thousandths
9. nine million, ninety thousand, nine hundred and ninety-nine ten-thousandths
10. four hundred sixty-eight thousand, forty-six and fourteen thousandths

Use < or > to make each sentence true.

11. 9 ■ 8
12. 164 ■ 246
13. 63,475 ■ 6,435
14. 52 ■ 50
15. 5.39 ■ 9.02
16. 43.94 ■ 53.69
17. 1.75 ■ 1.25
18. 1,476 ■ 1,467
19. 847.05 ■ 846.75

Skills Workshop 2

Rounding Whole Numbers and Decimals

When rounding whole numbers, first locate the digit in the place value to which you are rounding. If the digit to the right of it is 5 or greater, increase the digit in the specified place by 1. If the digit to the right of it is less than 5, the digit in the specified place remains the same. All digits to the right of the place value to which you are rounding become zero.

EXAMPLE 1 Round 4,782 to the nearest hundred.

SOLUTION Find the hundreds place. 4,7̲92 7 is in the hundreds place.

The digit to the right of 7 is 9.

Since 9 is greater than 5, round 7 up to 8.

So, 4,792 rounds to 4,800. All digits to the right of the hundreds place become zero.

When rounding decimals, follow the same procedure for rounding whole numbers except no zeros are needed if they are to the right of the place to which you are rounding and to the right of the decimal point. This is because they are not significant digits.

EXAMPLE 2 Round 8.243 to the nearest tenth.

SOLUTION Find the tenths place. 8.2̲43 2 is in the tenths place.

The digit to the right of 2 is 4.

Since 4 is less than 5, 2 remains the same.

So, 8.243 rounds to 8.200. All digits to the right of the tenths place are dropped.

8.200 can be written as 8.2

Round each number to the indicated place value.

1. 429 to the nearest ten
2. 9,058 to the nearest thousand
3. 36,815 to the nearest hundred
4. 85,726 to the nearest thousand
5. 48,280 to the nearest ten thousand
6. 392,682 to the nearest ten thousand
7. 6,329,451 to the nearest hundred thousand
8. 9,583,507 to the nearest thousand
9. 93,487,991 to the nearest hundred thousand
10. 4,540,597 to the nearest million
11. 0.38 to the nearest tenth
12. 6.849 to the nearest hundredth
13. 62.9042 to the nearest hundredth
14. 601.584 to the nearest tenth
15. 3.9015 to the nearest thousandth
16. 42.3952 to the nearest thousandth
17. 9.00391 to the nearest ten-thousandth
18. 0.92403 to the nearest ten-thousandth
19. 18.670308 to the nearest hundred-thousandth
20. 3.0040916 to the nearest hundred-thousandth

Skills Workshop 3

Add and Subtract Whole Numbers and Decimals

To add or subtract whole numbers and decimals, write the digits so the place values line up. Add from right to left, renaming when necessary. When adding or subtracting decimals, be sure to place the decimal point in the answer directly below the aligned decimals in the problem.

EXAMPLE 1

Find the sum of .058; 25.39; 6,346; and 1.57.

The answer is called the **total** or **sum.**

SOLUTION

```
  1 1 2
   0.058
   25.39
6,346.
 + 1.57
---------
6,373.018
```

The red zero is used to show there are no ones. The decimal point is at the end of whole numbers. Add from right to left.

EXAMPLE 2

Find the difference between 10,049 and 5,364.

The answer is called the **difference**.

SOLUTION

```
   9
 9 10 14
 10,049
- 5,364
--------
  4,685
```

Rename as needed to subtract.

EXAMPLE 3

Subtract 6.37 from 27.

The lesser number is subtracted from the greater.

SOLUTION

```
   9
 6 10 10
 27.00
-6.37
------
 20.63
```

Add a decimal point and zeros to help you complete the subtraction.

Add or subtract.

1. 23.146 + 17.215

2. 46.48 − 6.57

3. 52 − 1.95

4. 0.86 + 0.75

5. 83 − 82.743

6. 9.45 + 13.2

7. 14.5 − 9.684

8. 913.03 − 79

9. 0.8523 − 0.794

10. 1,765.36 + 1,587.50 + 1,400

11. 6.4 + 54.2 + 938.05 + 3.7 + 47.3

12. 51,876.36 + 48,156.95 + 1,417.86

13. 17,347.85 − 12,516.90

14. 76.2 + 80 + 56 + 9.321

15. 107,285 − 61,500.25

16. 567.1 + 6 + 13.452 + 100

17. 6.013 + 39 + 14.09

18. 4.621 + 372.14

19. 1,468,329 − 370,418.5

20. 472.13 + 1,695.006 + 27.127 + 50,040 + 0.578

Skills Workshop 4

Multiply Whole Numbers and Decimals

To multiply whole numbers, find each partial product and then add.

The red zeros are added to help align the answers.

Add. Then rewrite the answer with commas.

EXAMPLE 1 Multiply 5,754 by 236.

SOLUTION

5,754	factor
× 236	factor
34524	5,754 × 6
172620	5,754 × 30
+ 1150800	5,754 × 200
1357944	Add.
1,357,944	product

When multiplying decimals, locate the decimal point in the product so that there are as many decimal places in the product as the total number of decimal places in the factors.

EXAMPLE 2 Multiply 2.6394 by 3,000.

SOLUTION

2.6394	4 decimal places
× 3,000	+0 decimal places
7,918.2000	4 decimal places
or 7,918.2	

Zeros at the end (far right) *after* the decimal point can be dropped because they are not *significant digits*.

EXAMPLE 3 Multiply 3.92 by 0.023.

SOLUTION

3.92	2 decimal places
× 0.023	+3 decimal places
1176	
+ 7840	
0.09016	5 decimal places

The red zero is added *before* the nine, so the product will have five decimal places.

Multiply.

1. 36 × 45
2. 500 × 30
3. 17,000 × 230
4. 6.2 × 8
5. 950 × 1.6
6. 3.652 × 20
7. 179 × 83
8. 257 × 320
9. 8,560 × 275
10. 467 × 0.3
11. 2.63 × 183
12. 0.758 × 321.8
13. 49.3 × 1.6
14. 6.859 × 7.9
15. 794.4 × 321.8
16. 0.08 × 4
17. 0.062 × 0.5
18. 0.0135 × 0.003
19. 21.6 × 3.1
20. 8.76 × 0.005

Skills Workshop 5

Divide Whole Numbers and Decimals

Dividing whole numbers and decimals involves a repetitive process of estimating a quotient, multiplying, and subtracting.

Math *Tip*

In Example 1, 239 is the dividend, 7 is the divisor, 34 is the quotient, and 1 is the remainder.

EXAMPLE 1 Find 239 ÷ 7.

SOLUTION

```
  34        3 × 7
7)239       Subtract. Bring down the 9.
-21↓        4 × 7
  29
 -28
   1
```

EXAMPLE 2 Find 283.86 ÷ 5.7.

SOLUTION When dividing decimals, move the decimal point in the divisor to the right until it is a whole number. Move the decimal point in the dividend the same number of places that you moved the decimal point in the divisor. Then place the decimal point in the answer directly above the new location of the decimal point in the dividend.

```
5.7)283.86   →   57)2838.6
                   -228
                    558
                   -513
                     45 6
                    -45 6
                       0
```

If answers do not have a remainder of 0, you can add 0's after the last digit and continue dividing.

Divide.

1. 72 ÷ 6
2. 6,000 ÷ 2
3. 26,568 ÷ 8
4. 5.6 ÷ 7
5. 120 ÷ 0.4
6. 936 ÷ 12
7. 3.28 ÷ 4
8. 0.1960 ÷ 5
9. 1,968 ÷ 0.08
10. 16 ÷ 0.04
11. 1,525 ÷ 0.05
12. 109.94 ÷ 0.23
13. 0.6 ÷ 24
14. 7.924 ÷ 0.28
15. 32.6417 ÷ 9.1
16. 24 ÷ 0.6
17. 1,784.75 ÷ 29.5
18. 0.01998 ÷ 0.37
19. 7.8 ÷ 0.3
20. 12,000 ÷ 0.04
21. 820.94 ÷ 0.02
22. 121.55 ÷ 18.7
23. 29,000 ÷ 1,450
24. 5,929.52 ÷ 9.4
25. 618.03 ÷ 12.6
26. 22.1616 ÷ 34.2
27. 235,083.36 ÷ 67.09

Skills Workshop 6

Average of a Group of Numbers

An **average**, or **mean**, is a measure of central tendency. To find the average of a group of numbers, find the sum of the numbers, and then divide the sum by the number of items in the group.

EXAMPLE 1 Find the average of \$36, \$49, \$22, \$48, \$39, \$40, and \$18.

SOLUTION Find the sum of the numbers.

\$36 + \$49 + \$22 + \$48 + \$39 + \$40 + \$18 = \$252

Count how many items are in the group.

Divide the sum by 7 since there are 7 items.

$$\frac{\$252}{7} = \$36$$

The average of the set of numbers is \$36.

EXAMPLE 2 Find the average of the following set of numbers.

3.2, 4.2, 6.05, 9.25, 5, 7.1, 9.8, 12.4, 3.3

SOLUTION Find the sum of the numbers.

3.2 + 4.2 + 6.05 + 9.25 + 5 + 7.1 + 9.8 + 12.4 + 3.3 = 60.3

Count how many items are in the group.

Divide the sum by 9 since there are 9 items.

$$\frac{60.3}{9} = 6.7$$

The average of the set of numbers is 6.7.

Find the average of each set of numbers.

1. 85, 60, 72, 68, 95, 83, 97, 84
2. \$125, \$149, \$135, \$146
3. 260, 362, 302, 381, 295, 332, 280
4. 37, 28, 33, 30, 25, 15
5. 32,052; 33,559; 30,129; 34,058
6. 1.1, 1.5, 1.8, 2.7, 1.6
7. 6, 8, 9, 6, 3, 4, 6, 8, 7, 8, 6, 5, 9, 9, 8
8. 24.5, 20.5, 22.4, 28.2, 25, 23.7
9. 2.5, 3.5, 2.6, 2.8, 2.4, 3.2, 2.3, 3.1
10. \$545, \$425, \$600, \$562, \$399, \$457
11. \$17, \$24, \$28, \$16, \$28, \$17, \$18, \$24, \$22, \$25, \$29, \$25
12. \$625, \$501, \$399, \$572, \$459, \$680, \$377, \$540
13. \$10.25, \$12.32, \$11.24, \$13.08, \$14.48, \$10.76, \$15.30
14. 135.05, 241.62, 452.13, 105.95, 261.48
15. 9.1, 9.4, 9.9, 8.9, 9.3, 9.1, 9.1, 9.4, 8.8, 9.4
16. \$135.06, \$132.29, \$145.92, \$162.37, \$127.55, \$144.26, \$150.05, \$138.42

Skills Workshop 7

Multiply and Divide Fractions

To multiply fractions, multiply the numerators and then multiply the denominators. Write the answer in simplest form.

EXAMPLE 1 Multiply $\frac{2}{5}$ and $\frac{7}{8}$.

SOLUTION
$$\frac{2}{5} \times \frac{7}{8} = \frac{2 \times 7}{5 \times 8}$$
$$= \frac{14}{40}$$
$$= \frac{7}{20}$$

To divide by a fraction, multiply by the reciprocal of that fraction. To find the reciprocal of a fraction, invert (turn upside down) the fraction. The product of a fraction and its reciprocal is 1. Since $\frac{2}{3} \times \frac{3}{2} = \frac{6}{6}$ or 1, $\frac{2}{3}$ and $\frac{3}{2}$ are reciprocals of each other.

EXAMPLE 2 Divide $1\frac{1}{5}$ by $\frac{2}{3}$.

SOLUTION
$$1\tfrac{1}{5} \div \tfrac{2}{3} = \tfrac{6}{5} \div \tfrac{2}{3}$$ Write the mixed number as a fraction.
$$= \tfrac{6}{5} \times \tfrac{3}{2}$$ Rewrite division as multiplication by the inverse of the divisor.
$$= \tfrac{6 \times 3}{5 \times 2}$$ Multiply and simplify.
$$= \tfrac{18}{10}$$
$$= 1\tfrac{4}{5}$$

Multiply or divide. Write each answer in simplest form.

1. $\frac{2}{3} \div \frac{5}{6}$
2. $\frac{3}{5} \times \frac{10}{12}$
3. $\frac{5}{8} \div \frac{1}{4}$
4. $\frac{1}{2} \times \frac{2}{3}$
5. $\frac{2}{3} \times \frac{1}{2}$
6. $\frac{2}{3} \times \frac{1}{2}$
7. $\frac{1}{2} \div \frac{2}{3}$
8. $\frac{2}{3} \div \frac{1}{2}$
9. $\frac{3}{4} \div \frac{5}{8}$
10. $2\frac{2}{3} \div 1\frac{3}{5}$
11. $1\frac{1}{5} \times 2\frac{1}{4}$
12. $3\frac{1}{3} \times 1\frac{1}{10}$
13. $5\frac{2}{5} \div 2\frac{4}{7}$
14. $2\frac{4}{7} \div 5\frac{2}{5}$
15. $2\frac{4}{7} \times 5\frac{2}{5}$
16. $1\frac{7}{8} \div 1\frac{7}{8}$
17. $\frac{3}{4} \times \frac{2}{3} \times 1\frac{5}{8} \times 2\frac{2}{3}$
18. $\frac{1}{8} \times \frac{3}{4} \times 1\frac{2}{3} \times \frac{7}{10}$
19. $5\frac{1}{8} \times 3\frac{4}{5}$
20. $1\frac{4}{7} \div 7\frac{5}{6}$
21. $6\frac{3}{4} \times 9\frac{7}{8}$

Skills Workshop 8

Add Fractions

To add fractions with a common denominator, add the numerators and write the sum over the denominator they have in common. Then write the answer in simplest form.

EXAMPLE 1 Add $\frac{7}{8}$ and $\frac{3}{8}$.

SOLUTION

$$\begin{array}{r} \frac{7}{8} \\ +\frac{3}{8} \\ \hline \frac{10}{8} \end{array}$$

Add the numerators.
Use the common denominator.

Rewrite as a mixed number. $\frac{10}{8} = 1\frac{2}{8} = 1\frac{1}{4}$

To add fractions without a common denominator, first find a common denominator by finding the least common multiple of the denominators. Next, rename each fraction with an equivalent fraction using the common denominator. Then add the numerators and write the sum over their common denominator. Write the answer in simplest form.

EXAMPLE 2 Add $\frac{3}{4}$ and $\frac{5}{6}$.

SOLUTION

$$\begin{array}{rl} \frac{3}{4} = \frac{3}{4} \times \frac{3}{3} = & \frac{9}{12} \\ +\frac{5}{6} = \frac{5}{6} \times \frac{2}{2} = & +\frac{10}{12} \\ \hline & \frac{19}{12} \end{array}$$

Add the numerators.
Use the common denominator.

Rewrite as mixed number. $\frac{19}{12} = 1\frac{7}{12}$

Add. Write each answer in simplest form.

1. $\frac{1}{5} + \frac{2}{5}$
2. $\frac{2}{3} + \frac{1}{3}$
3. $\frac{8}{9} + \frac{4}{9}$
4. $\frac{11}{15} + \frac{4}{15}$
5. $\frac{1}{5} + \frac{1}{10}$
6. $\frac{5}{8} + \frac{3}{4}$
7. $\frac{16}{21} + \frac{2}{21}$
8. $\frac{6}{7} + \frac{1}{3}$
9. $\frac{11}{14} + \frac{3}{4}$
10. $2\frac{1}{2} + 3\frac{1}{2}$
11. $6\frac{5}{8} + 3\frac{7}{8}$
12. $3\frac{2}{3} + 4\frac{1}{2}$
13. $6\frac{1}{2} + 5\frac{7}{9}$
14. $7\frac{2}{3} + 6\frac{1}{5}$
15. $11\frac{4}{5} + 9\frac{1}{4}$
16. $4\frac{3}{8} + 2\frac{1}{6}$
17. $11\frac{2}{5} + 9\frac{4}{9}$
18. $5\frac{3}{10} + 13\frac{7}{8}$
19. $3\frac{1}{2} + 9\frac{4}{5} + 2\frac{2}{5}$
20. $1\frac{1}{5} + 2\frac{1}{3} + 5\frac{1}{4}$
21. $10\frac{7}{8} + 3\frac{3}{4} + 6\frac{1}{2} + 2\frac{5}{8}$

Skills Workshop 9

Subtract Fractions

To subtract fractions with a common denominator, subtract the numerators and write the difference over the common denominator. Then write the answer in simplest form.

EXAMPLE 1 Find the difference of $\frac{7}{8} - \frac{3}{8}$.

SOLUTION

$$\begin{array}{r} \frac{7}{8} \\ -\frac{3}{8} \\ \hline \frac{4}{8} \end{array}$$

To subtract fractions without a common denominator, first find a common denominator by finding the least common multiple of the denominators. Next, rename each fraction with an equivalent fraction using the common denominator. Then subtract the numerators and write the difference over the common denominator. Write the answer in simplest form.

EXAMPLE 2 Subtract $1\frac{3}{5}$ from $5\frac{1}{2}$.

SOLUTION

$$\begin{array}{rrr} 5\frac{1}{2} = & 5\frac{5}{10} = & 4\frac{15}{10} \\ -\,1\frac{3}{5} = & -\,1\frac{6}{10} = & -\,1\frac{6}{10} \\ & \uparrow & 3\frac{9}{10} \end{array}$$

You can not subtract $\frac{6}{10}$ from $\frac{5}{10}$, so rename again.

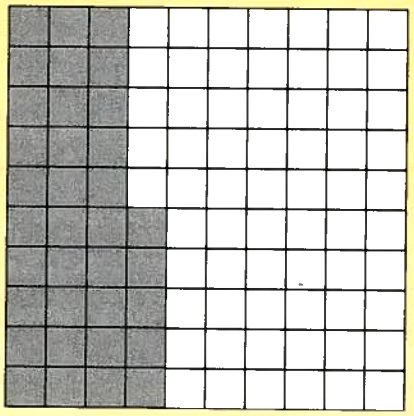
Subtract. Write each answer in simplest form.

1. $\frac{6}{7} - \frac{2}{7}$
2. $\frac{4}{9} - \frac{2}{9}$
3. $\frac{7}{16} - \frac{3}{16}$
4. $\frac{9}{11} - \frac{6}{11}$
5. $\frac{3}{4} - \frac{1}{3}$
6. $\frac{5}{8} - \frac{1}{4}$
7. $\frac{7}{12} - \frac{1}{6}$
8. $\frac{9}{10} - \frac{3}{4}$
9. $\frac{15}{16} - \frac{5}{8}$
10. $\frac{7}{8} - \frac{1}{5}$
11. $\frac{5}{8} - \frac{1}{12}$
12. $\frac{3}{5} - \frac{7}{12}$
13. $2\frac{3}{4} - 1\frac{1}{4}$
14. $5\frac{1}{8} - 3\frac{7}{8}$
15. $1\frac{1}{3} - \frac{2}{3}$
16. $8\frac{1}{10} - 5\frac{2}{3}$
17. $6\frac{1}{2} - 5\frac{3}{5}$
18. $10\frac{5}{8} - 9\frac{3}{4}$
19. $24\frac{4}{7} - 8\frac{5}{12}$
20. $15\frac{5}{6} - 13\frac{2}{3}$
21. $5\frac{1}{2} - 3\frac{4}{11}$
22. $24\frac{4}{7} - 8\frac{5}{12}$
23. $8\frac{4}{9} - 8\frac{3}{10}$
24. $37\frac{7}{8} - 33\frac{8}{9}$

Skills Workshop 10

Fractions, Decimals, and Percents

Percent means *per hundred*. Thus, 35% means 35 out of 100. Percents can be written as equivalent decimals and fractions.



$35\% = 0.35$ Move the decimal point two places to the left.

$35\% = \frac{35}{100}$ Write the fraction with a denominator of 100.

$= \frac{7}{20}$ Then simplify.

EXAMPLE Write $\frac{3}{8}$ as a decimal and as a percent.

SOLUTION $\frac{3}{8} = 0.375$ To change a fraction to a percent, first divide and write the answer as a decimal.

$0.375 = 37.5\%$ Change the decimal to a percent by moving the decimal point two places to the right and adding a percent symbol.

Percents greater than 100% represent whole numbers or mixed numbers.

$200\% = 2$ or 2.00 $\quad 350\% = 3.5$ or $3\frac{1}{2}$

Complete each table. Write all fractions in simplest form.

	Fraction	Decimal	Percent
1.	$\frac{1}{2}$		
2.		0.63	
3.			10%
4.	$\frac{1}{4}$		
5.		0.15	
6.			12%
7.			100%

	Fraction	Decimal	Percent
8.	$\frac{3}{4}$		
9.		0.4	
10.			150%
11.		2.35	
12.	$3\frac{7}{8}$		
13.			160%
14.		10.125	

Skills Workshop 11

Percent

To find a percent of a number, first write the percent as a decimal by moving the decimal point two places to the left. Then multiply the given number by this decimal.

EXAMPLE 1 Find 20% of 275.

SOLUTION Write 20% as a decimal.

$20\% = 0.2$

Multiply.

$$\begin{array}{r} 275 \\ \times\ 0.2 \\ \hline 55.0 \end{array}$$

So 20% of 275 is 55.

To find what percent a number is of another number, write a fraction where the numerator is the *part* and the denominator is the *whole*. Reduce the fraction if possible. Then divide to change the fraction to a decimal. Finally, change the decimal to a percent.

EXAMPLE 2 What percent of 50 is 16?

SOLUTION Write a fraction and reduce. $\frac{16}{50} = \frac{8}{25}$

Divide.

$$\begin{array}{r} 0.32 \\ 25\overline{)8.00} \\ -\ 7\ 5 \\ \hline 50 \\ -\ 50 \\ \hline 0 \end{array}$$

$0.32 = 32\%$

So, 16 is 32% of 50.

Math *Tip*

The *whole* is the number that comes after the word "of."

Find each percent.

1. 2% of 18
2. 21% of 54
3. 85% of 400
4. 25% of 384
5. 27% of 12.2
6. 82% of 55
7. 34% of 2,200
8. 72.5% of 340
9. 6% of 12,500

Find the following.

10. What percent of 60 is 42?
11. What percent of 5 is 2?
12. 9 is what percent of 36?
13. What percent of 45 is 36?
14. What percent of 125 is 32?
15. 81 is what percent of 3,600?
16. 28 is what percent of 32?
17. What percent of 63 is 63?
18. What percent of 112 is 21?
19. 114 is what percent of 475?

Skills Workshop 12

Estimation Skills

You can round numbers to find the estimated sum, difference, product, or quotient. Round the numbers to the highest place value they have in common and then perform the operation.

EXAMPLE 1 Find the estimated difference of 6,452 − 2,806.

SOLUTION Round each number to the nearest thousandth.

6,000 − 3,000 = 3,000 The difference is about 3,000.

You can use **front-end estimation** to find an estimated sum, difference, product, or quotient. Use only the front digit of each number and the rest of the digits become zero.

EXAMPLE 2 Find the estimated product of 842 × 67 using front-end estimation.

SOLUTION

$$\begin{array}{r} 842 \\ \times\ 67 \\ \hline \end{array} \longrightarrow \begin{array}{r} 800 \\ \times\ 60 \\ \hline 48{,}000 \end{array}$$

The product is about 48,000.

You can use **adjusted front-end estimation** by looking at more than the front digits to get an answer that is more accurate.

EXAMPLE 3 Find the estimated sum of 4,367 + 5,735 using adjusted front-end estimation.

SOLUTION

$$\begin{array}{r} 4{,}\boxed{367} \\ +\ 5{,}\boxed{735} \\ \hline 9{,}000 \end{array} \longrightarrow \text{about } 1{,}000$$

$$+ \quad 1{,}000 = 10{,}000$$

The sum is about 10,000.

Estimate by rounding the numbers.

1. 395 + 842
2. 9,940 − 2,504
3. 459 × 34
4. 837 ÷ 38
5. 34,651 + 84,648
6. 668,345 − 229,048
7. $338 × 22
8. $39,648 ÷ 196
9. $75,045 − $8,654

Use front-end estimation to perform each operation.

10. 248 × 49
11. 6,482 + 8,248
12. 946 ÷ 305
13. 8,459 − 6,218
14. 84,516 + 3,811
15. $735 × 63
16. $245,364 − $19,563
17. 946 + 358 + 205
18. $6480 ÷ 231

Use adjusted front-end estimation to perform each operation.

19. 5,638 + 3,281
20. 867 − 311
21. 326 + 284
22. 2,942 + 9,133
23. 649 − 48
24. 81,506 − 9,408
25. $3,945 − $3,108
26. $1,235 + 72
27. 948 + 629 + 755 + 371

Skills Workshop 13

Elapsed Time

The amount of time that passes between two given times is called elapsed time. You can find elapsed time by finding the difference in the earlier time and the later time.

EXAMPLE 1 Find the elapsed time from 9:15 A.M. to 10:55 A.M.

SOLUTION Subtract the earlier time from the later time.

$$\begin{array}{r} 10{:}55 \\ -\ 9{:}15 \\ \hline 1{:}40 \end{array}$$

The elapsed time is 1 hour and 40 minutes.

Sometimes you are not able to subtract the number of minutes in the earlier time from the number of minutes in the later time. When this happens, rewrite the later time with 1 less hour and 60 more minutes.

If one of the times is A.M. and the other is P.M., add 12 hours to the later time before finding the difference.

EXAMPLE 2 Find the elapsed time from 11:40 A.M. to 3:30 P.M.

SOLUTION

Subtract the earlier time from the later time.

$$\begin{array}{r} 3{:}30 \\ -\ 11{:}40 \\ \hline \end{array}$$

Rewrite 3:30 as 2:90

$$\begin{array}{r} 2{:}90 \\ -\ 11{:}40 \\ \hline \end{array}$$

Add 12 hours to 2:90 since one time is A.M. and the other is P.M.

$$\begin{array}{r} 2{:}90 + 12{:}00 \\ -\ 11{:}40 \\ \hline \end{array}$$

$$\begin{array}{r} 14{:}90 \\ -\ 11{:}40 \\ \hline 3{:}50 \end{array}$$

The elapsed time is 3 hours and 50 minutes.

Find the elapsed time.

1. from 5:00 P.M. to 11:00 P.M.
2. from 6:15 A.M. to 9:15 A.M.
3. from 2:10 P.M. to 7:33 P.M.
4. from 12:30 p.m. to 8:45 P.M.
5. from 8:00 A.M. to 5:00 P.M.
6. from 1:42 P.M. to 3:17 P.M.
7. from 2:55 A.M. to 9:45 A.M.
8. from 8:15 P.M. to 2:30 A.M.
9. from 11:00 A.M. to 9:00 P.M.
10. from 11:47 A.M. to 12:45 P.M.
11. from 4:12 P.M. to 1:33 A.M.
12. from 7:10 A.M. to 9: 30 P.M.
13. from 3:30 P.M. to 3:50 A.M.
14. from 9:33 P.M. to 4:08 A.M.
15. from 7:34 A.M. to 4:18 P.M.
16. from 1:42 P.M. to 3:37 A.M.
17. from 4:18 P.M. to 2:03 A.M.
18. from 7:56 A.M. to 5:12 P.M.

Skills Workshop 14

Problem Solving: 4-Step Plan

When solving word problems it is helpful to follow a 4-step plan.

1. **Understand** Read the problem and determine what information is given and what it is you are to find.
2. **Plan** Determine the method or strategy you will use to solve the problem.
3. **Solve** Carry out your plan to find an answer to the problem.
4. **Look Back** Go back over the problem and your answer to determine if your answer makes sense and make sure your computations are correct.

EXAMPLE 1 Jessica is buying two sheets of \$0.34 stamps from a vending machine. There are 20 stamps on each sheet. If she needs to put the exact amount of money in the vending machine, how much money does she need?

SOLUTION

Understand It is given that Jessica is buying 2 sheets of 20 stamps. Each stamp costs \$0.34. You are to find the total cost.

Plan First find the cost of one sheet. Then double this amount to find the cost of both sheets.

Solve

$\$0.34 \times 20 = \$6.80$ The cost of one sheet of stamps is \$6.80

$\$6.80 \times 2 = \$13.60$

The exact amount of money Jessica needs for the stamps is \$13.60.

Look Back You can use estimation to determine if your answer makes sense. Round the amount of one stamp to \$0.30.

$\$0.30 \times 20 = \$6.00$

$\$6.00 \times 2 = \$12.00$

Because the stamps are slightly more than \$0.30, the answer \$13.60 makes sense.

Use the 4-step plan to solve each problem.

1. Latoya earns \$1.75 an hour for each child she baby-sits. How much does she earn if she baby-sits 3 children for 4 hours?
2. James works at a department store and receives a 25% discount on his purchases. He purchases some new clothes at the store and his total before the discount is \$145.20. What is James's total after the discount?
3. Kegan borrows \$78 from his sister. He will pay her back over a 4-week period. If he pays the same amount each week, how much will he have paid back after the third week?
4. Ashley stops by the grocery to pick up a few items. She buys a loaf of bread for \$1.09, a pound of turkey for \$4.59, 2 cans of soup for \$0.79 each, and 4 oranges for \$0.27 each. How much money does Ashley spend at the grocery?
5. Jackie buys a one-way ticket to Nevada and a one-way ticket back home. Each way costs \$118. Joe buys a round-trip ticket to Nevada for \$227. Whose ticket is less? By how much?

Skills Workshop 15

Metric Measures

The basic metric units are meter (length), liter (capacity), and gram (mass or weight). All measurements can be expressed in terms of these three basic units. However, prefixes are used with the basic units to avoid dealing with very large and very small numbers.

The same prefixes are used for length, capacity, and mass.

1,000 m	100 m	10 m	1 m	0.1 m	0.01 m	0.001 m
kilo-meter	hecto-meter	deca-meter	meter	deci-meter	centi-meter	milli-meter
km	hm	dcm	m	dm	cm	mm

1,000 L	100 L	10 L	1 L	0.1 L	0.01 L	0.001 L
kilo-liter	hecto-liter	deca-liter	liter	deci-liter	centi-liter	milli-liter
kL	hL	dcL	L	dL	cL	mL

1,000 g	100 g	10 g	1 g	0.1 g	0.01 g	0.001 g
kilo-gram	hecto-gram	deca-gram	gram	deci-gram	centi-gram	milli-gram
kg	hg	dcg	g	dg	cg	mg

EXAMPLE 1 Change 0.68 meters to centimeters

SOLUTION Think: 1 m = 100 cm
0.68 m = 68 cm Move the decimal point right 2 spaces.

EXAMPLE 2 Change 8,000 grams to kilograms

SOLUTION Think: 1,000 g = 1 kg
8,000 g = 8 kg Move the decimal point left 3 spaces.

EXAMPLE 3 Change 5.2 liters to milliliters

SOLUTION Think: 1 L = 1,000 mL
5.2 L = 5,200 mL Move the decimal point right 3 spaces.

Change each measurement to the named unit.

1. 76 g = _ cg
2. 88 mL = _ L
3. 200 m = _ mm
4. 34 kL = _ cL
5. 123 mg = _ g
6. 7,065 L = _ kL
7. 4.35 g = _ hg
8. 0.98 m = _ cm
9. 12.5 kg = _ g
10. 44 dcm = _ mm
11. 600 kg = _ cg
12. 0.025 L = _ kL

Skills Workshop 16

Customary Measures

The only major industrial nation that uses the Customary System of Measurement is the United States. If you are converting from a larger unit to a smaller unit, multiply. If you are converting from a smaller unit to a larger unit, divide.

Length
1 foot (ft) = 12 inches (in.)
1 yard (yd) = 3 ft
1 mile (mi) = 5,280 ft or 1,760 yd

Mass or Weight
1 pound (lb) = 16 ounces (oz)
1 ton (T) = 2,000 lb

Capacity
1 tablespoon (tbsp) = 3 teaspoons (tsp)
1 fluid ounce (fl oz) = 6 tsp
1 cup (c) = 16 tbsp or 8 fl oz
1 pint (pt) = 2 c
1 quart (qt) = 2 pt
1 gallon (gal) = 4 qt

EXAMPLE 1 Change 3 feet to inches

SOLUTION Think: 1 ft = 12 in.

You are converting from a larger unit to a smaller unit, so multiply.

3 ft = 3 × 12 = 36 in. Multiply 3 by 12.

EXAMPLE 2 Change 6 cups to pints

SOLUTION Think: 1 pt = 2 c

You are converting from a smaller unit to a larger unit, so divide.

6 c = 6 ÷ 2 = 3 pt Divide 6 by 2.

EXAMPLE 3 Change 1.5 tons to pounds

SOLUTION Think: 1 T = 2,000 lb

You are converting from a larger unit to a smaller unit, so multiply.

1.5 T = 1.5 × 2,000 = 3,000 lb Multiply 1.5 by 2,000.

Change each measurement to the named unit.

1. 14 yd = __ ft
2. 7 qt = __ pt
3. 40 tbsp = __ c
4. 16 c = __ fl oz
5. 18 gal = __ qt
6. 5 mi = __ yd
7. 11,000 lb = __ T
8. 0.25 T = __ oz
9. 12 tsp = __ tbsp
10. 18 ft = __ yd
11. 7,920 ft = __ mi
12. 8 pt = __ gal
13. 252 in. = __ yd
14. 129 tsp = __ fl oz
15. 48 oz = __ lb

Skills Workshop 17

Sales Tax

Sales tax is a percentage of the price of an item or a percentage of the total of all taxable items. Sales tax is rounded to the nearest cent.

Sales Tax = Price of Item × Sales Tax Rate

The buyer pays the price of the item plus the sales tax.

Total Cost of Item = Price of Item + Sales Tax

EXAMPLE 1 Ellie Kramer purchased a chain saw priced at $285.99. She paid 6.5% sales tax. What amount did she pay in sales tax? What was the total amount Ellie paid for the chain saw?

SOLUTION 6.5% = 0.065 Write the sales tax rate as a decimal.
$285.99 × 0.065 = $18.58935, or $18.59 Multiply price by rate.
$285.99 + $18.59 = $304.58 Add price and sales tax.

To find the sales tax when some items of a purchase are not taxable, first find the subtotal of all taxable items. Then calculate the sales tax on that portion of the bill only. To find the total bill, add the subtotals of nontaxable and taxable items, with the amount of sales tax.

Sales Tax = Subtotal of Taxable Items × Sales Tax Rate

Total = Subtotal of Taxable Items + Subtotal of Nontaxable Items + Sales Tax

EXAMPLE 2 A service station mechanic took 3 hours to repair a car. The service charge was $65 an hour. Two parts were replaced at a cost of $117.98 and $49.39. A sales tax of 4% is charged on goods, but not on labor. Find the total bill.

SOLUTION 3 × $65 = $195 cost of nontaxable labor
$117.98 + $49.39 = $167.37 Add the cost of the taxable parts.
$167.37 × 0.04 = $6.694, or $6.69 Multiply rate by subtotal.
$195 + $167.37 + $6.69 = $369.06 nontaxable labor + taxable items + sales tax

Find the sales tax on each of the items below.

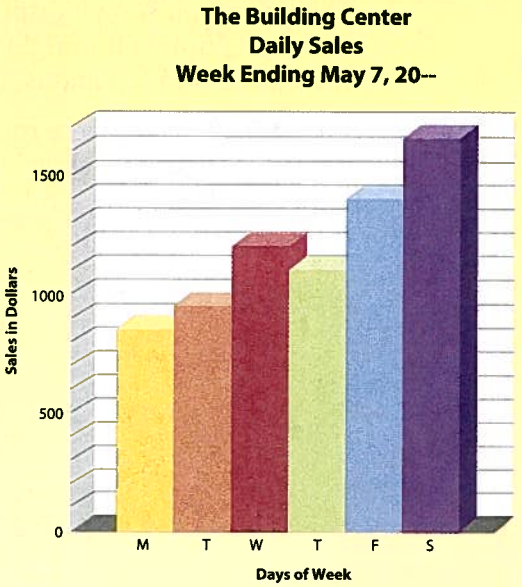
1. computer scanner, $99.99, 5.8%
2. garden tractor, $1,568.89, 3.5%
3. golf club set, $635.18, 2.9%
4. antique dresser, $498.89, 4.6%
5. Mona Allen wants to buy a bed that costs $695. The city sales tax rate is 7%. In a nearby city the sales tax rate is 4%. How much less would the bed cost if Mona bought it in the nearby city?
6. Rollie Gusewelle has his auto dealer install auto seat covers on his used car. The seat covers costs $189.99 and installation cost $45.89. The sales tax rate is 4.7% but is not applied to labor. What is the total cost of the seat covers to Rollie?

Skills Workshop 18

Bar Graphs

Business firms use graphs to show data about their companies or industries. Graphs often show facts and trends more clearly than do numbers in tables.

The vertical bar graph shown at the right displays the daily sales of The Building Center for a week. The height of each bar shows the sales for each day. Each vertical block on the graph equals $100 of sales. The daily sales are rounded to the nearest $50.



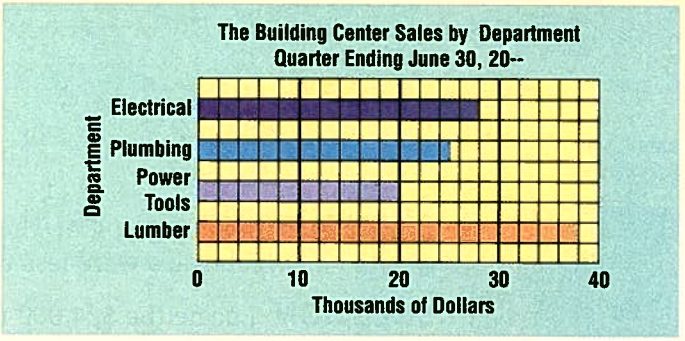
EXAMPLE 1 Use the vertical graph for The Building Center to find the day on which sales were the greatest. What was the amount of sales for that day?

SOLUTION Determine the sales for each bar. Select the bar that shows the greatest sales amount. The greatest sales amount is $1,650 for Saturday.

The horizontal bar graph at the right, with bars running left to right, shows the sales by department of The Building Center. Each horizontal block on the graph equals $2,000. The amounts for each bar were rounded to the nearest $1,000.

EXAMPLE 2 Use the horizontal graph above to find the department in which the sales for the second quarter were greater than $29,000. Find the total quarterly sales in that department.

SOLUTION Determine the sales represented by each bar. Identify the department with sales greater than $29,000. The lumber department's sales were $38,000.



Refer to the vertical bar graph of The Building Center for Exercises 1–3.

1. On which two days was the difference in sales the greatest?
2. On which days were sales below $1,200?
3. What were the total sales for Wednesday through Friday?

Refer to the horizontal bar graph of The Building Center for Exercises 4–5.

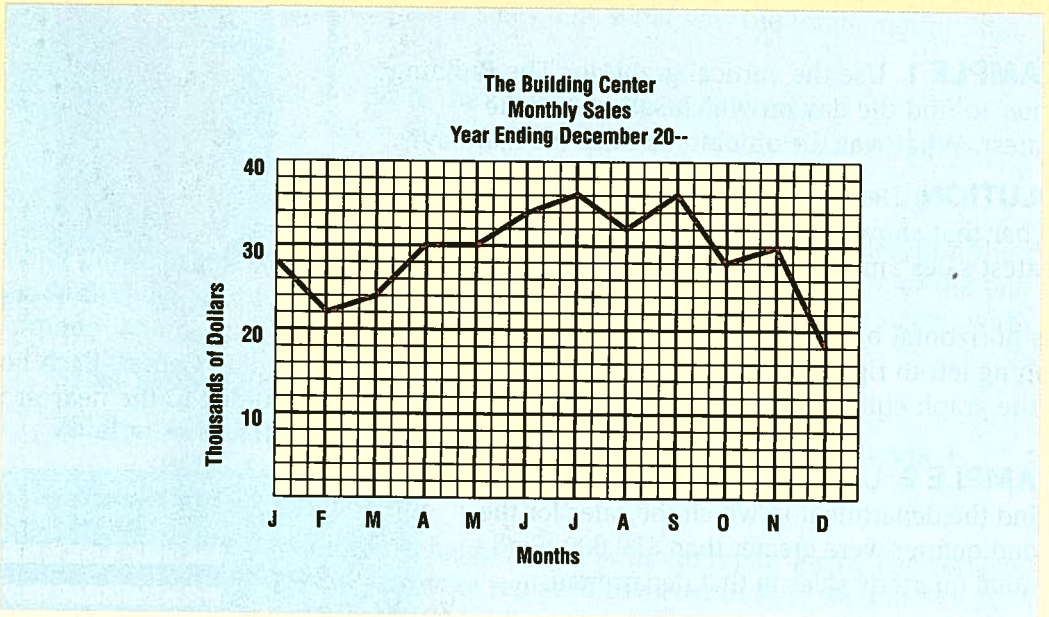
4. For which two departments were the sales most nearly the same during the quarter?
5. How much greater were the sales of lumber than the sales of power tools?

Skills Workshop 19

Line Graphs

The line graph shown displays the sales of The Building Center by months. The time scale runs from left to right and is at the bottom of the graph. The dollar scale runs from bottom to top and is at the left.

The monthly sales were rounded to the nearest $1,000. The line graph is made by first placing dots showing each month's sales. The dots are then connected by drawing a line using a ruler.



EXAMPLE Use the graph of The Building Center's monthly sales to find the months in which sales were less than $24,000.

SOLUTION Locate the $24,000 mark on the dollar scale. Locate all the months in which sales were below the $24,000 mark. February and December were months with sales less than $24,000.

Refer to the line graph of The Building Center for Exercises 1–4.

1. In the graph of The Building Center's monthly sales, what were the approximate sales for each month from October through December?
2. Between which two consecutive months did sales increase the most?
3. Between which months was there less than a $2,000 difference in sales?
4. What were the total sales for the second quarter of the year?

Skills Workshop 20

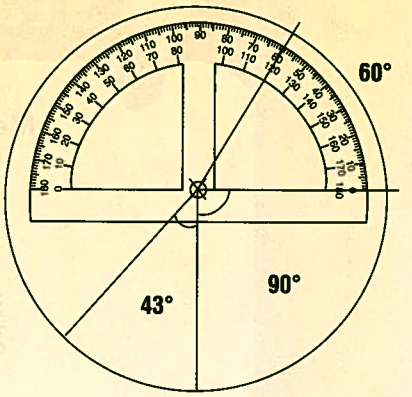
Circle Graphs

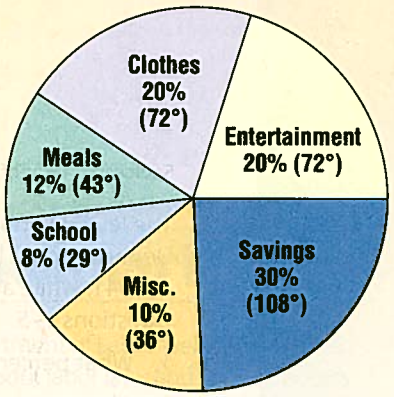
Circle graphs are used to show how parts relate to the whole and to each other. Circle graphs are based on a whole circle, or 100%. A circle has (360°). A circle graph is divided into parts, called sectors.

EXAMPLE Marvin earns $250 net pay per month. He plans to spend these amounts monthly in each category: Entertainment, $50; Clothes, $50; Meals, $30; School, $20; Miscellaneous, $25; Savings, $75. Display Marvin's budget in a circle graph.

SOLUTION Show the budget amounts as percents by dividing the amount budgeted for each category by the total budget, rounded to the nearest percent. Multiply each percent by 360°, rounded to the nearest whole degree.

Budget Category	Amount	Expressed as Percent	Degrees in Sector
Entertainment	$50	$\frac{\$50}{\$250} = 20\%$	20% of 360° = 72°
Clothes	$50	$\frac{\$50}{\$250} = 20\%$	20% of 360° = 72°
Meals	$30	$\frac{\$30}{\$250} = 12\%$	12% of 360° = 43°
School	$20	$\frac{\$20}{\$250} = 8\%$	8% of 360° = 29°
Miscellaneous	$25	$\frac{\$25}{\$250} = 10\%$	10% of 360° = 36°
Savings	$75	$\frac{\$75}{\$250} = 30\%$	30% of 360° = 108°
TOTALS	$250	$\frac{\$250}{\$250} = 100\%$	100% of 360° = 360°





Use a compass to draw a circle. Mark the center of the circle. Use a protractor to draw the angles from the center of the circle that match each degree calculated above. Label each category.

The table shows how LaRowe Company spent $60,000 on advertising.

Newspaper	$18,000
Direct mail	$15,000
Internet	$12,000
Coupons	$9,000
Product samples	$3,000
Other	$3,000

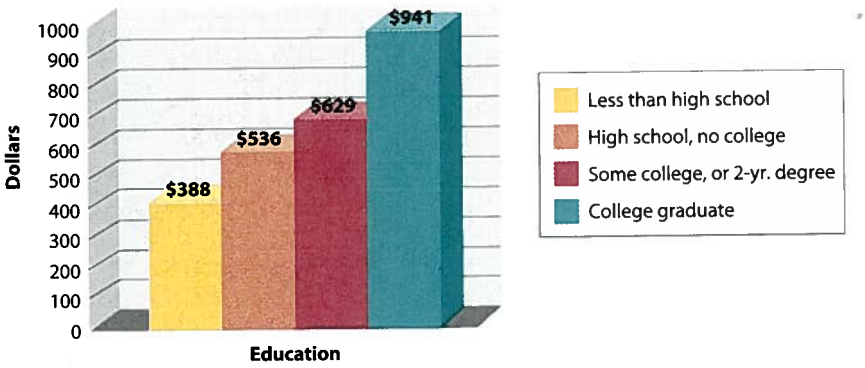
1. Find the percent of advertising spent on each type.
2. Make a circle graph of the LaRowe Company's advertising costs.

Chapter 1

Gross Pay

Statistical Insights

Median Weekly Income Based on Level of Education



Source: U.S. Dept of Labor, Bureau of Labor Statistics

The level of education people receive consistently affects their earning power. Statistics from the Department of Labor show an American with a college degree earns a median weekly income of $941; while a person without a high school diploma earns $388. Use the bar graph to answer Questions 1–5.

1. What percent of a college graduate's earnings does a high school graduate make?
2. About how many weeks would a person without a high school diploma have to work to earn what a person with some college does in one week?
3. How much less each week does a person that did not finish high school earn than a college graduate?
4. If the average person earns a 4-yr college degree by the age of 22, about how old would that person be when he or she earns in excess of $1,000,000 in gross wages?
5. If the average age of a person that drops out of high school is 17 years old, is it likely that a person that does not finish high school will earn in excess of $1,000,000 in gross wages before retirement at the age of 65? Explain.

How Times Have Changed

The minimum wage does not automatically rise with inflation. The United States Congress determines when and how much to raise the minimum wage. The 25-cent minimum wage set by Congress in 1938 seems very low by today's standards, but when taking inflation into account, 25-cents in 1938 would have the buying power of $3.81 in 2008.

1910

1912 Massachusetts enacts the earliest minimum wage law in the U.S.

1920

1930

1938 The federal government sets the minimum wage at $0.25/hour.

1940

1945 Minimum wage becomes $0.40/hour (effective Oct. 24).

1950

1960

1968 Minimum wage: $1.60/hour.

1970

1978 Minimum wage: $2.65/hour.

1980

1981 Minimum wage: $3.35/hour.

1990

1991 Minimum wage: $4.25/hour.

1997 Minimum wage: $5.15/hour.

2000

2007 Research the Fair Labor Standards Act that was amended in 2007 to find the changes made to the minimum wage laws

2010

NETBookmark

The U.S. Department of Labor web site provides information about labor laws and fair pay. Access www.cengage.com/school/business/businessmath and click on the link for Chapter 1. Can a state have a different minimum wage than the federal government requires? Find what the minimum wage is in your state.

1-1

Hourly Pay

GOALS

- Calculate gross pay for hourly-rate employees
- Compute overtime pay rates
- Calculate regular and overtime pay

KEY TERMS

- employee
- employer
- hourly rate
- gross pay
- overtime
- time-and-a-half pay
- double-time pay

Start Up ▶ ▶ ▶

Sarah has been offered a new job as an assistant manager in a shoe department. She will work 54 hours each week and earn $15 an hour. For this work schedule and rate of pay, is it possible for Sarah's gross pay for one month to be at least $3,750?

Photodisc/Getty Images

Math Skill Builder

Review these math skills and solve the exercises that follow.

1. **Round** to the nearest cent.
   Round. $1,874.898 = $1,874.90

   1a. $24.373 **1b.** $99.995 **1c.** $537.307

2. **Multiply** decimals. Remember to round to the nearest cent.
   Multiply. $18.30 × 6.5 = $118.95

   2a. $12.80 × 1.5 **2b.** $11.63 × 40.5 **2c.** $9.87 × 45.7

3. **Add** decimals.
   Add. 6.25 + 4.75 + 7.5 = 18.5

   3a. 5.5 + 7.25 + 8 + 7 + 6.75 **3b.** 8.4 + 9.1 + 7.7

   3c. 3.2 + 6.45 + 1.35 + 9 **3d.** 7.55 + 6.82 + 2.8 + 4.3

4. **Rewrite** fractions and mixed numbers as their decimal equivalents.
   Rewrite as a decimal. $1\frac{1}{2} = 1.5$

   4a. $\frac{3}{4}$ **4b.** $\frac{1}{2}$

   4c. $6\frac{3}{4}$ **4d.** $48\frac{3}{4}$

Gross Pay for Hourly-Rate Employees

Most people earn money by working for others. Those who work for others are called **employees**. The person or company an employee works for is called an **employer**.

An employee who is paid by the hour works for an **hourly rate**, which is a certain amount for each hour worked. The total amount of money that an employee is paid is called **gross pay** or *gross wages*. Gross pay may also be called total earnings or total pay.

The gross pay earned by employees who are paid by the hour is found by multiplying the pay per hour by the hours worked.

Gross Pay = Number of Hours Worked × Hourly Rate

Algebra *Tip*

Gross pay is calculated using the formula

$G = H \times R$

where G represents gross pay, H represents the number of hours, and R represents the rate of pay per hour.

EXAMPLE 1

Mark Willow works as a customer service representative and is paid \$9.10 per hour. He worked 38 hours last week. Find his gross pay.

SOLUTION

Substitute the known values in the formula.

$G = 38 \times \$9.10 = \$345.80$ $\quad G = H \times R$

Mark's gross pay for last week was \$345.80.

✔ CHECK YOUR UNDERSTANDING

A. Kenny Walker works as a shopping mall security guard and is paid \$7.50 an hour. Find his gross pay when he works 46 hours a week.

B. Cassie Boland earns \$16.25 an hour. What gross wages did she earn last week by working 25 hours?

Calculator *Tip*

When you input decimal numbers into a calculator, the decimal point in the answer will be placed correctly automatically. This feature is called *floating decimal point*. Your calculator will show 345.8. To write the answer, add the 0 and a dollar sign.

EXAMPLE 2

Sharon Medal is paid \$7 an hour. Last week Sharon worked 8 hours a day for 5 days. Find her gross pay for last week.

SOLUTION

$5 \times 8 = 40$ hours worked in last week

$G = 40 \times \$7 = \$280$ gross pay for last week

✔ CHECK YOUR UNDERSTANDING

C. Rosa Mendez works 8 hours Monday through Friday as a legal assistant. Her hourly wage is \$18.75. Find how many hours she worked in one week and her gross pay for that week.

D. Vincent O'Malley worked the following schedule one week: Monday, 8 hours; Tuesday, 6 hours; Wednesday, 7 hours; Thursday, 6 hours; Friday, 5 hours. He was paid \$9 an hour. How many hours did Vincent work that week and what was his gross pay?

Photodisc/Getty Images

Recording Hours Worked

Photodisc/Getty Images

Many companies keep an exact record of the number of hours their employees work. They record the times people arrive at work, take breaks, and leave for the day.

Companies may use electronic methods such as a magnetic stripe card or a time card to track employees' time. Other companies use a time sheet where employees write the hours they worked.

The hours that employees work are typically recorded by the quarter hour (15 minute segments) or the tenth of an hour (6 minute segments). Parts of the hour recorded in quarters shown as $\frac{1}{4}$, $\frac{1}{2}$, or $\frac{3}{4}$ of an hour, or 0.25, 0.5, or 0.75 hours. Parts of any hour recorded in tenths are shown as 0.1, 0.2, and so on.

Employees who arrive late or leave early may be penalized by a quarter or tenth of an hour. For example, a company that records time by the quarter hour may penalize an employee 15 minutes for arriving 3 or more minutes late.

Overtime and Overtime Pay Rates

Companies record regular hours of work and **overtime**, which is time worked beyond the regular working day or week. Daily overtime is based on a regular working day, such as an 8-hour day. So, an employee who works 10 hours in one day will be paid for 8 hours regular time and 2 hours overtime.

If the regular working week is 40 hours, then an employee who works 45 hours in a week is paid for 40 regular hours and 5 overtime hours.

Overtime pay is often figured at one and a half times ($\times$ 1.5) the regular-time rate and is called **time-and-a-half pay**. Sometimes **double-time pay** is given for work over a certain number of hours, or for work on weekends and holidays. Double-time pay is twice ($\times$ 2) the regular-time pay rate.

Time-and-a-Half-Rate = 1.5 × Regular Pay Rate (Do NOT round.)

Double-Time Rate = 2 × Regular Pay Rate (Do NOT round.)

Algebra *Tip*

To find the pay rate for overtime hours, whatever the multiplying factor is, use the formula,

$$O = F \times R$$

where O is the overtime pay rate, F is the number of times the regular pay rate is increased, and R is the regular pay rate.

EXAMPLE 3

Paul Mears' regular pay is \$10.73 an hour. His employer pays overtime at 1.5 of the regular rate and double time at twice the regular rate of pay. What are Paul's time-and-a-half and double-time pay rates?

SOLUTION

$1.5 \times \$10.73 = \$16.095$ time-and-a-half rate

$2 \times \$10.73 = \$21.46$ double-time rate

✔ CHECK YOUR UNDERSTANDING

E. Find time-and-a half and double-time rates for these regular-time pay rates.

1) \$7.51 **2)** \$8.76 **3)** \$13.67

F. Emilio's regular-time pay rate is \$11.25 per hour. What time-and-a-half and double-time rates would he earn for overtime work?

Regular and Overtime Wages

To find gross wages for an employee who has worked both regular time and overtime, use these steps.

Step 1: Find the number of regular-time and overtime hours worked.

Step 2: Find the regular time pay.
Regular Pay = Hourly Rate × Regular Hours Worked

Step 3: Find the overtime pay.
Overtime Pay = Overtime Rate × Overtime Hours

Step 4: Find the gross wages.
Gross Pay = Regular Pay + Overtime Pay

Photodisc/Getty Images

EXAMPLE 4

Stanley Bartlett worked these hours last week: Monday, $7\frac{1}{4}$; Tuesday, 10; Wednesday, $9\frac{1}{2}$; Thursday, 8; Friday, 9. Stanley is paid based on an 8-hour day with time-and-a-half for daily overtime. If Stanley's regular-time pay rate is \$9.50 per hour, what gross wages did he earn last week?

SOLUTION

Step 1: $7.25 + 8 + 8 + 8 + 8 = 39.25$ regular-time hours
$2 + 1.5 + 1 = 4.5$ time-and-a-half overtime hours

Step 2: $39.25 \times \$9.50 = 372.875 \approx \$372.88$ regular-time pay

Step 3: $4.5 \times \$9.50 \times 1.5 = \$64.125 \approx \$64.13$ time-and-a-half pay

Step 4: $\$372.88 + \$64.13 = \$437.01$ gross wages

Calculator *Tip*

It is often easier to work with decimals than fractions. To change a fraction such as $\frac{3}{4}$ to a decimal, use $3 \div 4 = 0.75$.

✔ CHECK YOUR UNDERSTANDING

G. Xavier Centor works an 8-hour day. He is paid \$13.69 an hour for regular-time work and time-and-a-half for any hours over 8 hours a day. Xavier worked these hours last week: Monday, $9\frac{3}{4}$; Tuesday, 8; Wednesday, 6; Thursday, $8\frac{1}{2}$; Friday, 8. Complete all steps to find Xavier's gross wages for last week.

H. Diedra McKenney works on a 40-hour week basis with time-and-a-half paid for overtime work. Her regular-time hourly rate is \$17.50. Last week she worked 45.3 hours from Monday through Thursday and 8.1 hours on Friday. Complete all steps to find Diedra's gross wages for last week.

Wrap Up ▶ ▶ ▶

If Sarah is paid regular time for the 54 hours per week, her weekly gross pay is \$810. A month has anywhere from 4 weeks to about $4\frac{1}{2}$ weeks. So, Sarah's monthly pay will be between \$3,240 and \$3,645. If Sarah earns time-and-a-half overtime pay for any hours over 40 hours a week, then she would make between \$3,660 and \$4,117.50 per month.

TEAM Meeting

Imagine you are responsible for supervising a small group of workers and have been assigned to write guidelines for them. The company you work for expects employees to be on time for work and not leave early. The penalty for employees who break this work rule is a loss of pay.

What rules would you have about paying employees who are ill or need time off from work to take care of personal business? Will the rules be different for new employees or the same as those rules for people who have been with the company longer? Be fair to your employees, to yourself, and to the company when writing the guidelines. As a class, discuss everyone's guidelines. Make a list of the rules the class generally agrees on.

Exercises

Find each sum.

1. $8 + 7 + 6.5 + 7 + 8$
2. $7 + 6.5 + 7.5 + 8 + 6$
3. $\$1{,}500 + \$723$
4. $\$680 + \$72$

Find each product.

5. $38 \times \$12$
6. $40 \times \$9.80$
7. $25 \times \$412$
8. $7.5 \times \$8.10$
9. $7.75 \times \$418$
10. $10 \times \$1{,}200$

Rewrite as decimals.

11. $40\frac{1}{4}$
12. $\frac{3}{4}$
13. $43\frac{1}{2}$

Round to nearest cent.

14. \$78.438
15. \$298.987
16. \$419.097

Solve.

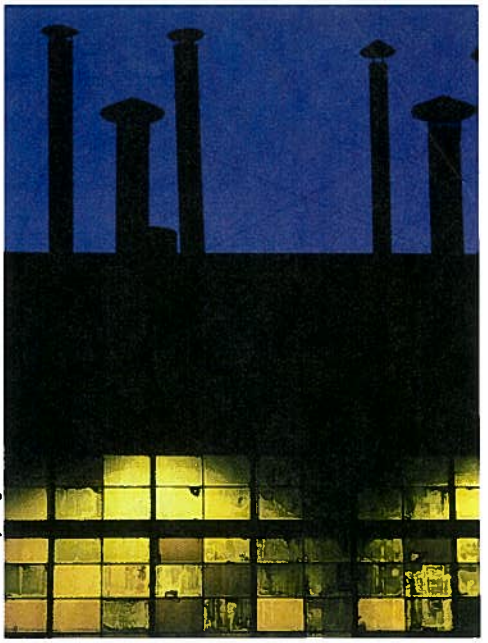
17. Francesco Jardin earns \$7 an hour at his part-time job. Last week he worked 16 hours. What was his gross pay for the week?
18. Alberta Doan worked 6 hours at time-and-a-half pay and $3\frac{1}{4}$ hours at double-time pay. Her regular pay rate was \$9.72 an hour. What was Alberta's total overtime pay for the week?

Jaci Welk is paid $11.95 an hour with time-and-a-half pay for all hours she works over 40 hours a week. Last week she worked $45\frac{1}{2}$ hours.

19. How many overtime hours did Jaci work?

20. What was her overtime rate?

21. What was her overtime pay?



Photodisc/Getty Images

Steve Gaimes is paid overtime for all time worked past 40 hours in a week. His regular-time pay rate is $12 an hour, and his overtime pay rate is $18 an hour. Last week Steve worked 47.3 hours.

22. How many regular-time hours did Steve work last week?

23. How many overtime hours did he work last week?

24. What was Steve's regular-time pay last week?

25. What was his overtime pay last week?

26. What was Steve's gross or total pay last week?

Ike Phillips worked 6.7 hours at time-and-a-half pay and 3.4 hours at double-time pay last week. His regular earnings for the week were $454.80 figured on a regular pay rate of $11.37 an hour.

27. What were Ike's time-and-a-half and double-time pay rates?

28. What amounts did he earn for time-and-a-half and double-time work?

29. What was Ike's total gross pay for the week?

The chart below shows the hourly pay and hours worked for Trilton Company's three employees. Employees get paid time-and-a-half for any hours worked over 40 hours per week. Copy and complete the chart.

Employee	Hourly Pay	Hours Worked	Gross Pay
30. Rick Wilson	$9.25	40	
31. Art Dillart	$9.45	52	
32. Letitia Reed	$9.75	42	
33. Total			

34. **CRITICAL THINKING** At the end of an interview you are offered a job. You would start at $7.50 an hour and work an average of 45 hours a week. At the end of six months with a positive evaluation, your hourly pay would increase to $8. The job pays overtime at a time-and-a-half rate, based on a $37\frac{1}{2}$ hour regular work week. What total earnings could you expect to make by working a full year?

Mixed Review

35. $680 + $302

36. 52 × $826

37. 40 × $7.80

38. 7.5 × $9.42

39. 115% × $30

40. $34,000 ÷ $10,000

1-2

Salary

GOALS
- Compare hourly pay and salary
- Calculate gross pay for salaried employees

KEY TERM
- salary

Start Up ▶ ▶ ▶

Riel is offered two jobs. One job pays $11.25 per hour and requires 40 hours a week, 50 weeks a year. The other job has a salary of $22,000 per year and includes 2 weeks of vacation. What should he consider in order to decide which job to take?

Blend Images/Jupiter Images

Math Skill Builder

Review these math skills and then answer the questions that follow.

1. **Multiply** money amounts by whole numbers.
Find the product. $385 × 12 = $4,620

1a. $520 × 4 **1b.** $782 × 2 **1c.** $500 × 52

2. **Divide** money amounts by whole numbers.
Find the quotient. $27,000 ÷ 12 = $2,250

2a. $42,000 ÷ 24 **2b.** $65,000 ÷ 52 **2c.** $18,000 ÷12

3. **Round** to the nearest cent.
Round this amount to the nearest cent. $842.875 = $842.88

3a. $675.891 **3b.** $893.996 **3c.** $258.333

Comparing Hourly Pay and Salary

Some employees are paid a **salary**, which is a fixed amount of money for each pay period worked. These employees are referred to as *salaried employees* and have an agreement with their employers about how much the job pays, their responsibilities, and benefits.

Salaried employees get paid a fixed amount, regardless of the number of hours worked. They do not get paid for overtime hours. A full-time salaried employee may work more than 40 hours per week on a regular basis.

Unlike hourly employees, salaried employees still get paid the same amount even if they miss work due to illness or a vacation, as long as they are within the guidelines specified by the employer.

Typically, salaried employees earn more money than hourly employees and often more education and skills are required. For example, a bank manager would likely be paid a salary, while a bank teller would likely be paid an hourly rate.

Gross Pay for Salaried Employees

Salaries are often stated as a yearly amount, although they can be stated by day, week, or month. Salaried employees are most often paid monthly, bi-monthly (2 times/mo), bi-weekly (every other week), or weekly. For a salaried employee, if a weekly or monthly salary is known, find the annual gross pay by multiplying the salary for a pay period by the number of periods worked. If a yearly salary is known, find the gross pay per pay period by dividing the annual salary by the number of time periods in a year.

EXAMPLE 1

Albert Meyer is paid a salary of $465 a week. How much gross pay does Albert receive for 4 weeks of work?

Math *Tip*

1 year = 12 months
1 year = 52 weeks
1 year = 365 days

SOLUTION

$465	pay for 1 week
× 4	weeks worked
$1,860	gross pay for 4 weeks

✔CHECK YOUR UNDERSTANDING

A. Tek Research pays its office manager a weekly salary of $680. What gross pay will the office manager receive every 2 weeks?

B. Tom works as a dispatcher and is paid a weekly salary of $540. What gross pay will Tom earn for one year of work?

EXAMPLE 2

Janice Compton is paid a yearly salary of $51,000. What are her gross monthly wages?

SOLUTION

Divide the yearly salary by 12, and round to the nearest cent, if necessary.

$51,000 ÷ 12 = $4,250 monthly wages; There are 12 months in a year.

✔CHECK YOUR UNDERSTANDING

C. How much gross pay will a salaried worker receive each week if he is paid $85,000 yearly?

D. A bank manager makes $95,000 per year. If she is paid bi-monthly, what are her gross wages each paycheck?

Wrap Up ▶ ▶ ▶

Riel should compare the gross earnings for each job. The hourly rate job pays $22,500 per year, assuming that he works 40 hours per week for 50 weeks of the year. The salaried job will pay $22,000, even if he takes sick leave, but he may have some weeks that he has to work more than 40 hours. Riel could consider the hours required for the salaried position are not fixed. He could also consider which job has the work that he likes best or that will help him in his future.

Consumer Alert

Work at Home Scams

"Make BIG $$ working from the comfort of your own home. Work a few hours a day, and make $10,000 a month!"

Work from home job listings are everywhere—on television, radio, Internet, and hanging on the local bulletin board. Some claim you can make big bucks stuffing envelopes, doing data entry, typing ads, or any number of ways. Typically these jobs come with no hourly wage or salary, only a promise you will make money. Often they require you to pay fees or make purchases in order to get started.

Most of these work-at-home opportunities are scams that are designed to take your money, and not make you money.

Tips for Avoiding Work From Home Scams:

1. Avoid listings that guarantee you wealth or financial success or that will help you get rich fast. If it sounds too good to be true, it probably is.
2. Check out the company with the Federal Trade Commission, the Better Business Bureau, state Attorney General, or your local consumer protection agency.
3. Check references. Ask for names of contractors or employees to speak with about the company.
4. Ask how you will be paid, and how often.
5. Ask what equipment you need to provide.
6. Do not send money. Legitimate employers don't charge you to get started.
7. Do not purchase work-at-home directories or start-up kits. Free information is available online.
8. Do not give out your personal information to a person or company you don't know.

Exercises

Find the product or quotient.

1. $\$15{,}000 \div 12$
2. $\$24{,}000 \div 24$
3. $\$1{,}875 \times 24$
4. $\$584 \times 52$

Round to the nearest cent.

5. $\$1{,}435.783$
6. $\$589.355$

Solve.

7. Tom Page earns $368 a week. Tom is paid every two weeks. What gross pay does he receive each payday?
8. Eldon Cavanaugh is paid a weekly salary of $562. How much would Eldon earn in 4 weeks of work?

Emily Casper earns a weekly salary of $785. How much will she make after:

9. two weeks
10. four weeks?
11. one year?

Jorge Rodriguez earns an annual salary of $48,000. Find his gross wages for each given pay period.

12. monthly
13. bi-weekly
14. weekly

Photodisc/Getty Images

15. **STRETCHING YOUR SKILLS** Ryo Akita currently earns a monthly salary of $2,200. She has been offered a raise of $250 per month. How much more will she earn per year at her new salary?
16. **STRETCHING YOUR SKILLS** An employer has three employees who are each paid a salary of $1,250 per month. He wants to give each of the three employees a $125 per month raise and he wants to hire an additional salaried employee. If his salary budget for these employees is $5,325 per month, how much can he afford to offer the new employee?
17. **CRITICAL THINKING** What are the advantages of being paid a salary instead of an hourly rate? What are the disadvantages of being paid a salary instead of an hourly rate?
18. **FINANCIAL DECISION MAKING** You are offered two jobs that you like. One job pays an hourly rate of $15.00 per hour for a 40-hour work week. Employees can take a two-week paid vacation. The employer says you will work about 5 hours of overtime per week at time-and-a-half pay. The other job pays $38,000 per year. You will be expected to work at least 55 hours per week, and you will have two weeks vacation and sick leave. Which job would you choose? Why?

Mixed Review

19. $835 × 52
20. $1,435.60 × 12
21. $15,000 ÷ 12
22. Andrea Marshall is paid $10 per hour for a 40-hour work week, and time-and-a-half for hours over 40 per week. She worked the following hours last week: Monday 9 hours, Tuesday 7 hours, Wednesday $8\frac{1}{2}$ hours, Thursday 6 hours, Friday 9 hours, Saturday 3 hours. What were her gross wages?
23. Joanna Grimshaw makes an hourly rate of $12.50, and she works 40 hours per week. Her boss offers her a promotion to a salaried position that pays $675 per week. How much more will she earn per week with the salaried position?

1-3

Commission

GOALS

- Calculate straight commission earnings
- Calculate commission earnings based on quota
- Calculate graduated commission earnings
- Find the rate of commission

KEY TERMS

- commission
- straight commission
- quota
- graduated commission

Start Up ▶ ▶ ▶

Two sales jobs are advertised in the newspaper. The first job pays a commission of 3.5% on all sales, with expected sales of $52,000 a month. The second job pays a commission of 4% on sales up to $5,000 and 12% on sales over $5,000, with expected sales of $25,000 a month. Based on the expected sales, which job pays more?

Photodisc/Getty Images

Math Skill Builder

Review these math skills and solve the exercises that follow.

1. **Rewrite** a percent as a decimal. Rewrite this percent. 50% = 0.5

   1a. 12% **1b.** 18.6% **1c.** 2.5%

2. Find a **percent of a number**.
   Find the percent. 1% of $1,956 = 0.01 × $1,956 = $19.56

   2a. 14% of $500 **2b.** 3.5% of $1,200

   2c. 12% of $600 **2d.** 2% of $38.50

3. **Rewrite** a decimal as a percent. Rewrite this decimal. 0.25 = 25%

   3a. 0.08 **3b.** 0.75

   3c. 0.01 **3d.** 0.1825

4. Find **what percent** one number is of another number. Find the percent.
   $10 ÷ $80 = 0.125 or 12.5%

   4a. $15 ÷ $75 **4b.** $4,800 ÷ $32,000

   4c. $34 ÷ $68 **4d.** $8 ÷ $200

Straight Commission

Some salespeople earn a commission instead of a fixed salary or hourly pay. A **commission** may be an amount for each item sold, or it may be a percent of the dollar value of sales. A higher commission may be earned for goods that are harder to sell than for goods that are easy to sell. Both a salary and a commission may be earned.

Salespeople whose earnings come only from commission work on a **straight commission** basis. When the rate of commission is an amount for each item sold, multiply the number of items by the rate to find the commission.

Commission = Quantity Sold × Rate of Commission

Algebra *Tip*

A verbal model can be helpful when solving problems.

Commission Paid = Amount × Rate of Commission

$C = A \times R$

A represents a quantity or sales. *R* is a rate and when it is a percent it needs to be converted to a decimal.

EXAMPLE 1

Maxwell Lytle sells decorative notepads and is paid a straight commission of $0.80 on each notepad he sells. During December, he sold 750 notepads. Find his commission.

SOLUTION

$C = 750 \times \$0.80 = \$600$ commission

✔ CHECK YOUR UNDERSTANDING

A. Lorraine Wilk is paid a commission of $1.30 for each hand-painted tile she sells. What commission did she earn by selling 74 tiles last week?

B. Leo Margolis receives a $0.075 commission for each newspaper he sells at his newsstand. What commission would he earn by selling 1,200 newspapers?

Photodisc/Getty Images

When the rate of commission is a percent, multiply the amount of the sales by the rate to find the commission.

Commission = Sales × Rate of Commission

EXAMPLE 2

Huey Gaines is paid a straight commission of 6% on his sales. During February, his sales were $38,000. What was his commission?

SOLUTION

$C = \$38{,}000 \times 0.06 = \$2{,}280$ commission

✔ CHECK YOUR UNDERSTANDING

C. Melvin's sales last month of a new tile cleaner were $9,500. If he receives a commission rate of 15% of all sales, what commission did he earn?

D. Jacqueline earned 15% commission on her monthly sales of $2,870, $3,150, and $3,940. What was her total commission for the three months?

Commission Based on Quota

Some salespeople may be paid a commission that is a percent of their sales above a certain amount. This fixed amount is called a **quota**. Salespersons may also be paid a salary in addition to commission.

EXAMPLE 3

Leona Bahr is paid a commission of 12% on all sales above $7,000 for the week. She is also paid a weekly salary of $380. What are her total earnings for a week in which her sales were $9,800?

SOLUTION

Sales	$9,800
Quota	−7,000
Sales over Quota	$2,800

Commission: $2,800 × 0.12 = $336

Salary	$380
Commission	+$336
Total Earnings	$716

Leona's total earnings were $716.

✔CHECK YOUR UNDERSTANDING

E. Colby Richards is paid a salary of $125 a week and a 3% commission on all sales he makes above $2,000 for the week. What total earnings did he have for a week in which his sales were $2,890?

F. Lula Krobo is paid a 7% commission on all sales over $15,000 in a month and a monthly salary of $2,300. Her last month's sales were $29,700. What were Lula's total earnings for the month?

Graduated Commission

Some salespeople are paid a **graduated commission**. This means their rate of commission increases as their sales increase. For example, the rate may be 3% on the first $12,000 of sales; 4% on the next $6,000; and 5% on sales over $18,000. Graduated commissions may also be based on the number of units sold.

EXAMPLE 4

Lamont Cotton is paid 4% commission on the first $10,000 of monthly sales and 10% on all sales over $10,000. Last month his sales were $38,000. What was his commission?

SOLUTION

Commission on first $10,000: $10,000 × 0.04 = $400

Sales over $10,000: $38,000 − $10,000 = $28,000

Commission on sales over $10,000: $28,000 × 0.10 = $2,800

Total commission: $400 + $2,800 = $3,200

✔ CHECK YOUR UNDERSTANDING

G. Morgan Lee is paid a commission of 3% on the first $100,000 of monthly sales and 5% on any sales above that amount. What commission did he earn if his sales for a month were $120,000?

H. Janice Corrudo is paid a commission of 15% of her yearly sales up to $85,000 and 18% of any sales above $85,000. Her total sales for last year were $112,000. What total commission did she earn last year?

Rate of Commission on Sales

To find the rate of commission, divide the amount of commission paid on total sales by the total sales amount.

Rate of Commission = Amount of Commission ÷ Sales

EXAMPLE 5

A salesperson sold a laptop computer and software for $3,000 and received a $120 commission. What percent commission did the salesperson receive?

SOLUTION

$120 ÷ $3,000 = 0.04 = 4%

Calculator *Tip*

If your calculator has a % key, you can find the percent directly by following these steps: key 120, press ÷, key 3000, press %. Be sure to add the percent symbol to your answer.

✔ CHECK YOUR UNDERSTANDING

I. Marc received a commission of $448 for selling $6,400 in goods in the past two weeks. What rate of commission did he earn?

J. Nedra's sales last month were $54,000 for which she received a commission of $3,240. What rate of commission was Nedra paid?

Wrap Up ▶ ▶ ▶

The first sales job would pay monthly commission of $1,820. The second job would pay commission of $200 on the first $5,000 of sales and $2,400 on the $20,000 of sales over $5,000 in a month. Total monthly commission for the second job would be $2,600. The second sales job pays more.

Communication

The BBB Company now pays a straight commission of 15% of all monthly sales. Expected sales are $24,000 a month per salesperson. The company's new plan will pay a monthly salary of $1,500 and a 22% commission on all sales over $15,000 a month. Write a statement that either accepts or rejects the new plan based on an increase or decrease in the annual wages of salespeople.

Exercises

Rewrite as a decimal.

1. 9.25%
2. 16.2%
3. 0.5%

Find the amount.

4. 12% of $800
5. 7.5% of $13,000
6. 4.2% of $569

Find the percent.

7. $1.26 ÷ $7
8. $1.20 ÷ $8
9. $90 ÷ $2,000

Rewrite as a percent.

10. 0.08
11. 0.11625
12. 0.0025

Solve.

13. Dan Pawlik is paid a straight commission of $5.75 for each item he sells. Last month he sold 103 items. Find his estimated and exact commissions.

14. A student who sells subscriptions for a magazine that costs $35 a year makes a commission of $5.25 on each subscription. What percent commission does the student make?

15. Paul Batik earns a commission of 9% on sales. Last week he had sales of $646.70, $237.58, $1,984.89, $658.66, and $953.73. Find his total commission to the nearest cent.

16. Jo Ann White is paid a salary of $410 a week and a commission of 5.6% on all sales. Her sales last week were $6,700. Find her total earnings for the week.

17. Sheldon Cole earns a salary of $150 a week and a commission of 7% on all sales. If Cole's sales for one week were $6,890, what were his total weekly earnings?

18. Roosevelt Quinn receives a weekly salary of $600 plus $\frac{1}{2}$% commission on all sales in excess of $12,500 a week. Last week his sales were $48,370. What were his total earnings for the week?

19. Alice Miller works for a paint manufacturer. She is paid 3% commission on her first $20,000 of monthly sales and 8% commission on all sales over $20,000. In March her sales were $54,500; in April, her sales totaled $47,300. What were the total commissions she earned for the 2 months?

20. Olivia Thoms sells surplus books to bookstores. She is paid a weekly commission of $1.50 each on the first 50 books she sells, $1.75 each on the next 100 books, and $2 on any books she sells over 150. Last week she sold 225 books. What was her commission for the week?

21. Ludmilla Pavel is paid a commission on all sales over $3,000 a week. Last week she earned a commission of $420 on sales of $16,000. What rate of commission was she paid to the nearest tenth percent?

22. Nola Potter earns a salary of $1,200 a month and a commission of 7.5% on all sales over $4,000. This month her sales were $21,400. Find her total earnings for the month.

Martin Ellis sells a line of cooking pots. He is paid a salary of $1,150 a month plus a commission on all sales. Last month his sales were $35,000, and he earned a total salary and commission of $3,250.

23. How much commission was Martin paid?

24. What rate of commission was he paid?

25. **CRITICAL THINKING** When a new inkjet printer model is introduced salespeople may be paid a larger commission by their store for each old printer model they sell. Why would the store's manager offer such an incentive to salespeople?

26. **CRITICAL THINKING** Write two paragraphs that explain the advantages and disadvantages of working on commission. The first paragraph should be from an employee's viewpoint, the second from the viewpoint of an employer.

27. **FINANCIAL DECISION MAKING** You see ads on an Internet job listing service from two companies looking for salespeople. Both companies market a weight-loss system. The Slo-Loss Company pays a weekly salary of $100 and a commission of 14.5% on sales. The Slim-Now Company pays a straight commission of 30% of sales. Both companies expect you to be able to have sales of $1,000 in the first month and reach sales of $5,000 at the end of six months. List the reasons in outline form why you want to get one job over the other.

Mixed Review

28. Find $\frac{1}{4}\%$ of $28,000

29. $97,398 \times 1\%$

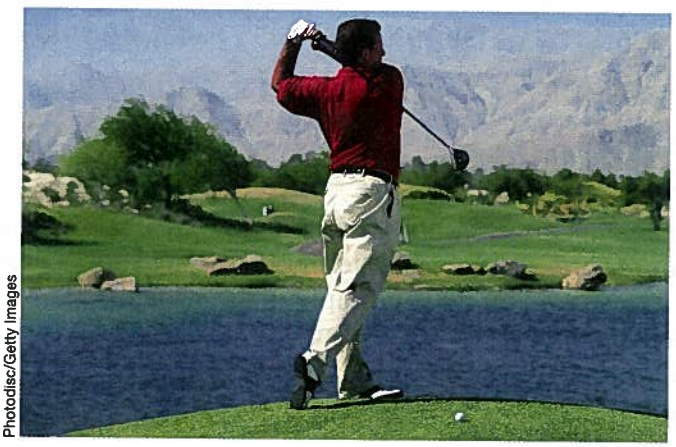
30. 60 is 15% of what number?

31. 20% more than $18 is what amount?

32. $250 decreased by what percent of itself is $235?

33. Marc Bullard has two part-time jobs. At one job he worked 12 hours last week and was paid $8.15 an hour. Marc worked 6.25 hours last week at his second job that pays $7 an hour. What was his gross pay last week from both jobs?

34. Carolyn Mills does maintenance work at a golf course. She worked these hours last season: April, 150; in each of the next four months, 200; September, 100. If she gets paid $10.50 an hour, what was her gross pay for the season?



Photodisc/Getty Images

1-4

Other Wage Plans

GOALS

- Calculate gross pay for piece-rate employees
- Calculate gross pay for per diem employees
- Calculate gross pay for tip employees

KEY TERMS

- piece-rate
- per diem
- tip

Start Up ▶ ▶ ▶

Employees whose pay varies widely may need to estimate or project annual gross income based on current earnings. Assume that a waiter's monthly earnings from hourly wages and tips for the first quarter of the year are: January, $1,367; February, $1,845; March, $2,398. What is the projected annual gross income for the waiter?

Photodisc/Getty Images

Math Skill Builder

Review these math skills and solve the exercises that follow.

1. **Add** whole numbers and money amounts.
   Find the sum. 34 + 25 + 31 + 37 + 28 = 155

   1a. 78 + 92 + 101 + 86 **1b.** $135 + $176 + $157

2. **Multiply** money amounts by whole numbers.
   Find the product. 347 × $0.81 = $281.07

   2a. 181 × $1.24 **2b.** 5 × $98

3. **Multiply** money amounts by percents.
   Find the product. 15% × $54 = 0.15 × $54 = $8.10

   3a. 20% × $26 **3b.** 5% of $20.45 **3c.** 10% of $60

Piece-Rate Employees

Employers use a variety of ways to pay their employees. Some employees are paid for each item or *piece* they produce. Their wages are paid on a **piece-rate** basis. To figure their gross pay, you must multiply their pay per piece by the number of pieces produced. If employees are paid only for usable pieces produced, they get no pay for the pieces that are rejected.

Gross Pay = Number of Pieces Produced × Piece Rate

EXAMPLE 1

Helen Burchett is paid $1.30 for each usable picture frame she produces. What was Helen's gross pay for last week if she produced the following quantities of usable frames:

Monday	52
Tuesday	47
Wednesday	54
Thursday	50
Friday	45

SOLUTION

$52 + 47 + 54 + 50 + 45 = 248$ usable frames produced

$G = 248 \times \$1.30 = \$322.40$ gross pay

Algebra *Tip*

A verbal model for a piece-rate wage is:

Gross Pay = Number × Rate

$G = N \times R$

N represents the number of items produced. R is the rate paid per piece.

✔ CHECK YOUR UNDERSTANDING

A. Louise Schubert is paid $18 for each computer she installs at customer offices. She installed these numbers of computers in 5 days last week: 7, 6, 9, 8, 5. What gross pay did Louise earn for the week?

B. Trevor Sherr is paid $1.20 for each hand-painted dish he produces. He is not paid for dishes that are not acceptable. On Monday, he painted 56 dishes; on Tuesday, he painted 44 dishes. For the two days 6 dishes contained slight errors and were unacceptable. What gross pay did Trevor earn for the two days?

Photodisc/Getty Images

Per Diem Employees

Some people are paid on a per diem basis. **Per diem** means "by the day." Per diem employees are paid a fixed daily amount by their employer. Many per diem employees are temporary employees provided to a company by temporary help agencies.

Self-employed persons may charge a per diem rate for their services. These people may provide a specialized service to their clients. Self-employed persons work for themselves instead of for employers.

The gross pay of someone paid by the day is found by multiplying the per diem rate by the number of days worked.

Gross Pay = Number of Days × Per Diem Rate

EXAMPLE 2

Shawn Traylor worked 5 days last week as a temporary computer operator. His per diem pay rate was $120. What gross pay was Shawn paid for the week?

SOLUTION

$G = 5 \times \$120 = \$600$ gross pay for the week

✔ CHECK YOUR UNDERSTANDING

C. Sherry McCoy is a tax consultant. She charges $425 per diem for her services. If she worked 180 days last year, what was her gross income for the year?

D. Charlie's neighbors are often out of town and they hire him to house-sit. They pay Charlie $20 for each day they are gone. If they were out of town 57 days last year, what was Charlie's income from house sitting?

Tip Employees

Many workers receive income in the form of tips. A **tip** is an amount of money given to someone for services they provide. The person receiving the service pays a tip voluntarily. Many employees who earn tips are paid less than minimum wage, and some employees who receive tips must share them with other employees who assist them.

A tip, also called a *gratuity,* is calculated as a percentage when there is a dollar value attached to the service. A waiter, for example, may receive a tip of 20% of the total restaurant bill.

Tip Amount = Total Bill × Tip Percent

An airport skycap, on the other hand, may receive a specific amount for each piece of luggage handled.

Tip Amount = Number of Units × Tip Per Unit

Tipping practices vary considerably. The table below suggests guidelines for tipping certain types of workers. Most people round tips to the nearest quarter, or even dollar amount.

	Suggested Tipping Amounts
Airport skycap	$1 per bag
Hair stylist	15% of cost, minimum $1
Hotel chambermaid	$5 to $9 a night
Pizza delivery person	$1 to $5 depending on distance
Waiter/waitress	15–20% of total bill
Buffet waitstaff	5–10% of total bill
Taxi driver	15% of fare

Algebra *Tip*

Formulas for calculating hourly pay, commission, piece-rate, per diem and tips are all based on **amount × rate.** The Amount may be hours, sales, pieces, days or total bill, while the rate may be a dollar amount, percent, or unit.

Math *Tip*

A quick way to calculate a 20% tip is to double the amount of a 10% tip. A 10% tip on a bill of $25.00 is $2.50. (Move the decimal point left one place.)

NET Bookmark

Tipping guidelines for many other tip employees are available online. Use the Internet to find the tipping guidelines for three other types of employees.

EXAMPLE 3

After the Sutton family finished their meal at a local restaurant, the waiter brought them a check for $46.86. If Mrs. Sutton leaves a 20% tip, what amount of tip wages will the waiter receive for serving dinner to the Suttons? What will be the total meal cost to the Sutton's?


Photodisc/Getty Images

SOLUTION

The check amount is multiplied by the tip percentage to find the amount of the tip. The tip is added to the check amount to find the meal's total cost.

$T = 20\% \times \$46.86 = 0.2 \times \$46.86 = \$9.372$ round tip to $9.50

$\$9.50 + \$46.86 = \$56.36$ total meal cost

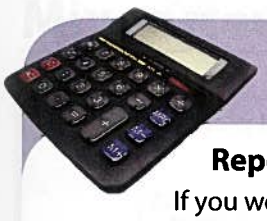
✔ CHECK FOR UNDERSTANDING

E. Jack orders the lunch special and a beverage. His check comes to $10.20. How much will the waitress receive if a 15% tip is left? What is the total cost of the meal to Jack?

F. Lydia and Sarah share a cab ride to work. Their fare is $7.60. At 15%, how much should they tip the driver? What is their total cost to ride the cab?

Wrap Up ▶ ▶ ▶

A waiter's total earnings for the first 3 months, or one quarter year, are $5,610. Since there are 4 quarters in a year, multiply the total earnings for three months by 4 to find the total gross income for the year. So, $5,610 × 4 = $22,440 total annual gross income.



Financial Responsibility

Reporting Tips

If you work in a job where you receive tips, you are required to document how much you receive in tips and report the amount to your employer.

If you are an employer in the restaurant industry, the amount of tips that tip employees report must be at least 8% of your total receipts.


Stockbyte/Getty Images

1. Jason is a waiter at a local restaurant. He made the following in tips last week: $65, $55, $125, $93, $75. How much tip income should he report to his employer for the week?
2. The restaurant that Jason works for had $50,000 in total receipts last week. What is the minimum amount of tip income that should be reported by all of the tip employees?

Exercises

Find the sum.

1. $40 + 38 + 39 + 45 + 41$
2. $\$135 + \$18.60$

Find the product.

3. $87 \times \$1.12$
4. $3 \times \$97$
5. $15 \times \$3 \times 5$

Find the product.

6. $5\% \times \$38$
7. $20\% \times \$187$
8. $\$425 \times 22$

Solve.

9. An airport skycap handled 520 bags in a weekend. His average tip per bag was $1.25. What total earnings did he have from tips for the weekend?

Photodisc/Getty Images

10. A waitress in an exclusive restaurant presented a food and beverage check in the amount of $340 to customers at a table. The customers decided to leave a 20% tip. What tip amount did the waitress receive?

11. Sandra Mitchell worked 22 days last month as a temporary employee in the Purchasing department. Her per diem pay was $95. What were Sandra's total earnings for the month?

12. To meet a shortage of medical staff, a doctor agreed to work 6, 24-hour shifts in the emergency room of a hospital during the next year. She is paid $950 for each shift worked. What total pay will the doctor receive for the 6 days of emergency room work?

13. Lu Ying works at the Wilkins Bike Shop and is paid $3.25 for every bike he assembles. The shop owner charges customers $20 for this service. During the five working days of one week, Lu assembled these numbers of bikes: 27, 33, 29, 27, 31. What was Lu's gross pay for that week?

For each of these piece-rate employees at Dover Industries, find the total pieces produced and the gross pay for the week. Copy and complete the chart.

	Name	M	T	W	T	F	Total pieces	Rate per piece	Gross Pay
14.	Zinke, T	54	55	59	62	60		$1.60	
15.	Bello, V.	24	28	30	31	27		$2.80	
16.	Dixon, S.	63	69	59	62	50		$1.55	
17.	Maier, B.	68	65	72	74	75		$1.18	

18. **FINANCIAL DECISION MAKING** You are offered two jobs. One job pays an hourly rate of $8.50, and requires 40 hours of work per week. The second job pays $5.25 per hour plus tips and requires 8 hours per day, 5 days per week. Another employee who does the same job says that he usually earns about $50 per day in tips. Based on the pay scale, which job would you accept, and why?


Photodisc/Getty Images

19. CRITICAL THINKING Steve took a taxi from the airport to his hotel across town. The fare came to $19.30. Steve handed the driver a $20 bill and told him to keep the change. Do you think Steve gave the driver a generous tip, an adequate tip, or not enough tip to express his appreciation for good service?

INTEGRATING YOUR KNOWLEDGE Fred must make a decision about keeping his current job, which he dislikes, or accepting an offer for a new job, which he thinks he would enjoy. His current job pays an hourly rate of $12. Fred works 40 hours a week.

At the new job, Fred would earn $0.80 for each item he produces up to 125 pieces per day. For each piece over 125 produced in a day, Fred would receive $0.85. The average production rate is 15 pieces an hour. Because of his experience and skill, Fred believes that he can produce 18 an hour. At the new job, Fred would work 8 hours a day, 5 days a week.

20. What is the average weekly pay received by employees at the new job?

21. How much does Fred expect to make each week at the new job?

22. What is Fred's weekly pay at his current job?

23. Create a chart, like the one shown, that will allow you to compare both jobs by estimated daily, weekly, and annual earnings based on Fred's predictions that he will produce 18 pieces an hour.

	Current Job	New Job
Daily Earnings		
Weekly Earnings		
Annual Earnings		

Mixed Review

24. $1\frac{5}{8} + 2\frac{3}{4}$

25. $15 \div \frac{5}{8}$

26. What number increased by 8% of itself equals 1,944?

27. Bob Turnquist works 42 hours a week at a pay rate of $12.50 an hour. What amount will Bob earn in 4 weeks?

Brenda Peoples earned $43,680 last year. Her usual work schedule is 50 hours a week. What were her average earnings

28. per month?

29. per week?

30. per hour?

31. Danny Mills receives a salary of $660 a month and a 7.5% commission on all sales above his monthly sales quota of $15,000. His sales for February totaled $32,000. What was Danny's total income for February?

32. A waitress at a Sunday brunch served 50 customers in a 4-hour period. The total of all the food and beverage checks she wrote for customers was $1,500. Her customers left an average tip of 8%. What is her tip income for Sunday?

1-5

Average Pay

GOALS
- Calculate simple averages
- Calculate averages from grouped data
- Find the unknown item in a set of data

KEY TERMS
- average
- mean

Start Up ▶ ▶ ▶

A six-figure income is a total yearly earnings amount that most people will never receive. A six-figure income means that a person has annual earnings from $100,000 to $999,999. If one person earning $100,000 and another earning $999,999 annually were paid each week, what would be their gross pay each week, rounded to the nearest dollar?

Michael G. Smith/Shutterstock.com

Math Skill Builder

Review these math skills and solve the exercises that follow.

1 **Divide** money amounts.
Find the quotient. $95 ÷ 5 = $19

1a. $450 ÷ 5
1b. $18,000 ÷ 12
1c. $720 ÷ 15
1d. $4,708 ÷ 22

2 **Round** to the nearest cent.
Round this amount to the nearest cent. $9.287 = $9.29

2a. $8.765
2b. $9.996
2c. $7.097
2d. $13.602
2e. $526.889
2f. $0.737

3 **Multiply** money amounts by whole numbers.
Find the product. 8 @ $8.25 = $66

3a. 7 @ $7.25
3b. 4 @ $178
3c. 4 @ $7.25
3d. 11 @ $1.65
3e. 9 @ $12.20
3f. 100 @ $0.573

Math *Tip*

1 year = 12 months
1 year = 52 weeks
1 year = 365 days

Math *Tip*

The symbol @ means at. It means the same as multiply.

Simple Averages

An **average** is a single number used to represent a group of numbers. The most commonly used average is the **mean**.

A mean is found by adding several numbers and dividing the sum by the number of items added. Another name for a simple average is the *simple average*.

EXAMPLE 1

Tricia Willard earned these amounts for the 5 days she worked last week: Monday, $82; Tuesday, $91; Wednesday, $96; Thursday, $80; Friday, $86. What was her average pay for the 5 days?

SOLUTION

Add daily amounts to find total pay.

$82 + $91 + $96 + $80 + $86 = $435 total pay

Divide the sum by the number of days to find the average pay per day.

$435 ÷ 5 = $87 average pay per day

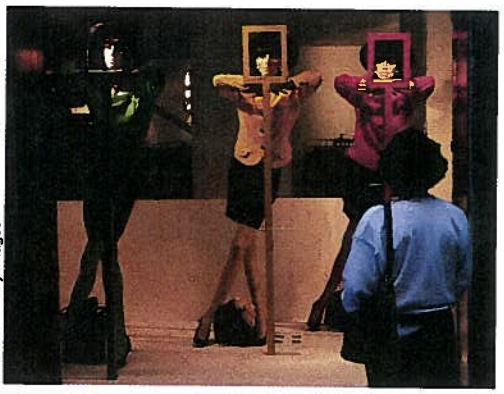
Calculator *Tip*

Be sure you press [=] to find the total pay before you divide.

✔ CHECK YOUR UNDERSTANDING

A. Monica Wilkes earned these amounts last week at her part-time job: Friday, $18; Saturday, $58; Sunday, $32. What was her average daily pay for the 3 days she worked?

B. A clothing designer earned these amounts in four consecutive months: $2,400; $3,200; $1,500; $1,700. What average monthly earnings did the designer have for these 4 months?



Photodisc/Getty Images

EXAMPLE 2

Valeria Mishkov earns $18,000 per year as assistant manager at a local store. Find her average pay per hour (to the nearest cent) if she works 37.5 hours for 50 weeks per year and gets 2 weeks paid vacation.

SOLUTION

Find total weeks for which pay is received.

50 + 2 = 52 weeks

Find total hours for which she is paid in 1 year.

37.5 × 52 = 1,950 total hours

Divide the total earnings by the number of hours. Round the final answer to the nearest cent.

$18,000 ÷ 1,950 = $9.2308, or $9.23 average pay per hour

Math *Tip*

In solving problems in this book, round to the nearest cent all answers involving money amounts unless you are directed otherwise.

✔ CHECK YOUR UNDERSTANDING

C. Last month Antoine Beal earned $264 by working 38 hours at his part-time job. What average hourly pay did he earn last month, to the nearest cent?

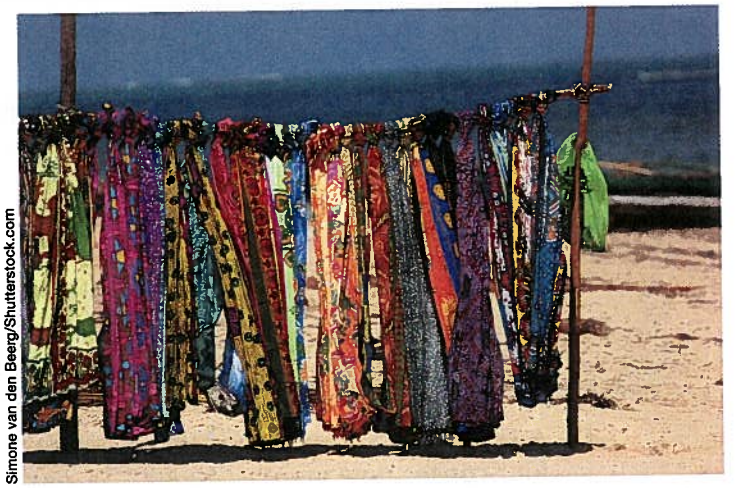
D. LaKeisha Jones earned $35,800 in the first year of her new job. After receiving a promotion she earned $47,000 in the second year. What were her average earnings for the two years?

Averages in Grouped Data

A number or rate can occur more than once in a set of data. When that happens, you can find the sum quickly by grouping the common numbers.

EXAMPLE 3

Brandon Chin sells sarongs at the beach. During the first month of the season, he earned $600. For the next three months he earned $1,050 per month. In the last month, Brandon earned $180. What were his average earnings per month?



Simone van den Berg/Shutterstock.com

SOLUTION

Find his total earnings for months worked.

1 month @ $600 = $600

3 months @ $1,050 = $3,150

1 month @ $180 = $180

5 total months = $3,930 total earnings

Divide the total earnings by the months worked.

$3,930 × 5 = $786 average monthly earnings

✔ CHECK YOUR UNDERSTANDING

E. The Runwell Company has 8 employees. Five of the employees earn $12 an hour, two earn $9 an hour, and 1 earns $11 an hour. What is the average amount per hour that the employees are paid?

F. Rosalind Jeszko earns a commission in addition to her salary. She earned these amounts in commission in the first 4 weeks of the year: $280, $315, $424, $265. What was her average commission for the 4 weeks, rounded to the nearest dollar?

Calculator *Tip*

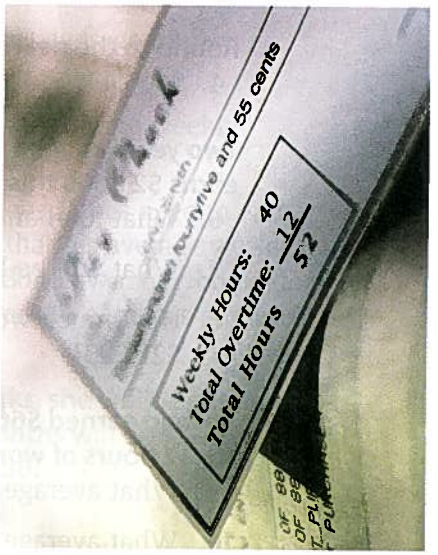
Find the total using the memory keys. For each line, after you find the product, press M+ to store the product. Repeat for each line of multiplication. When all of the multiplication is done, press MR. The total will be displayed, and you can divide by the number of items. To clear the memory before a new problem, press MC.

Unknown Items in a Set of Data

If one item in a group or set of data is unknown, you can find it. Averages are used often in finding the value of the unknown item.

EXAMPLE 4

The weekly pay of four picture frame assemblers in a company averages \$433 per employee. The weekly pay amounts of three of the four employees are \$400, \$410, and \$460. What is the weekly pay of the fourth employee?



Photodisc/Getty Images

SOLUTION

Multiply the average pay by 4 to find the total pay.

$\$433 \times 4 = \$1{,}732$ total pay

Add to find the total pay of the three employees.

$\$400 + \$410 + \$460 = \$1{,}270$ total pay of 3 employees

Subtract the totals to find the missing weekly pay.

$\$1{,}732 - \$1{,}270 = \$462$ weekly pay of fourth employee

✔ CHECK YOUR UNDERSTANDING

G. To earn a \$2,000 bonus, Kylene must average \$25,000 in sales in a six-month period. If her sales for the first 5 months are \$22,000, \$30,000, \$28,000, \$20,000, and \$18,000, how much must she sell in the last month to earn a bonus?

H. Hank Borden was paid \$420 for 5 days work. For 4 of those days, his average pay was \$86. Find his pay for the fifth day.

Wrap Up ▶ ▶ ▶

The six-figure income must be divided by 52 weeks to calculate the average weekly pay. A person earning \$100,000 would earn \$1,923 weekly. The person earning \$999,999 would earn \$19,231 weekly. Because the weekly pay figures are rounded, the answers are approximate.

TEAM Meeting

This class activity will simulate a company's weekly payroll for hourly-rate employees. You need two boxes. In a box marked Dollars, place a slip of paper for each amount from \$5 to \$11. In a box marked Cents, place paper slips marked from \$0.55 to \$0.95 in multiples of 0.05. Each student randomly chooses one slip from each box. The numbers drawn become the student's hourly rate. After each draw, return the slips to the boxes.

1. List all hourly rates. Record the number of students at each rate.
2. Find the average hourly pay rate for all class members.
3. Calculate the total weekly gross pay for all students for a 40-hour week.
4. Find the average weekly gross pay of the class.

Exercises

Find the quotient or product.

1. $620 ÷ 40
2. 12 × $1,578
3. 4 @ $12.75

Round to the nearest cent.

4. $406.439
5. $10.407

Two years ago Randi earned $18,400. Last year she earned $19,700. Suppose she earns $21,600 this year.

6. What total amount will Randi have earned for the three years?
7. What will be her average earnings per year?
8. How much would Randi have to earn next year so that her four year average is $21,000?

Rashad earned $662 by working five days a week at his full-time job. He earned $118 for 12 hours of work at his part-time job.

9. What average pay per day did he earn from full-time work?
10. What average amount per hour did he earn from part-time work?

Solve.

11. Ben's earnings for work he did from Monday through Saturday were: $78, $94, $115, $108, $67, $78. What was his average daily pay for the days he worked?
12. Four employees are paid a monthly salary as follows: Wilma, $1,820; Mavis, $1,615; Martha, $1,977; Tom, $1,560. What is their average salary per month?
13. Emma has been offered a job that pays $38,950 for working 52 weeks. What average amount does the job pay per month? per week?
14. Beatrix Thompson owns a craft shop and plans to sell 260 ceramic vases this year. She earns $25 for every vase sold. For the first 8 months of this year, she sold an average of 16 vases a month and had total earnings of $3,200. How many vases must she sell, on average, in each of the remaining 4 months to reach her goal?
15. At her job of grooming horses, Polly Yaskovich worked 8 hours a day on Monday and Tuesday earning $69 each day. On Wednesday, she earned $82. On Thursday, she earned $78. How much must Polly earn on Friday, to have average earnings of $75 a day?
16. The Willis Avenue Door Company gave its employees bonuses. Six employees received a bonus of $940 each; 4 employees received a bonus of $820 each; 5 employees were paid a bonus of $1,150 each. What was the average bonus paid to these employees?
17. The owner of Mid-Town Rapid Delivery plans to spend no more than $980 a day for employees' wages. The owner now has 8 employees who earn an average of $108 a day. What is the most a new employee can be paid without spending more money than planned?

Photodisc/Getty Images

Photodisc/Getty Images

Three weeks ago James worked 46 hours and earned $414. Two weeks ago he earned $333 by working 37 hours. Last week he worked 42 hours for $378.

18. What were his total earnings?

19. What were his average hourly earnings?

20. What were his average weekly earnings?

21. How much does James need to earn this week so that his average weekly earning is $380? How many hours does he have to work to earn this amount?

Yi Chin was offered a new job. For the first 3 months she works, she will be paid a monthly salary of $1,600. Her monthly pay for the next 3 months will be $1,760. For the next 6 months after that, Yi's monthly salary will be $1,936.

22. How much will Yi earn during a full year?

23. What average pay per month will she receive if she works a full year?

24. **STRETCHING YOUR SKILLS** Marsha's scores on seven tests were: 82, 78, 77, 93, 85, 91, and 86. What does she need to score on her next text to have an 86 average?

25. **STRETCHING YOUR SKILLS** The owner of a small business bought 5 cases of copier paper for $14 each, 8 cases for $13.50, and 11 cases for $12.75. What average price did the owner pay for each case, to the nearest cent?

26. **CRITICAL THINKING** The owner of a business has two skilled employees who each earn $160 a day and 12 unskilled employees who each earn $56 a day. Find the average daily pay for the 14 employees. Does the average show what the "average" worker is paid?

27. **FINANCIAL DECISION MAKING** The daily cost of public transportation to get you to and from your current job is $5. You regularly work 8 hours a day Monday through Friday and 4 hours on Saturday. You have been offered a new job close to home where you could walk to and from work each day. The new job pays $0.75 less an hour than your current job. You will work an average of 44 hours a week. Will you make or lose money by taking the new job?

Mixed Review

28. Find the quotient: $31,920 ÷ 12

29. Find the product: $235 × 4

30. What is $12.655 rounded to the nearest cent?

31. Carmella Petrocelli earns a weekly salary of $1,352 as a web site designer. If she works at this pay rate for a year, what will be her total annual earnings?

32. Tracy Voisene earns $18.15 an hour. What are her gross weekly wages if she works 40 hours at regular pay and 12 hours at time-and-a-half pay?

Chapter Review

Vocabulary Review

Find the term, from the list at the right, that completes each sentence. Use each term only once.

1. The total amount of an employee's earnings is called __?__.
2. Pay that is 1.5 times the regular hourly pay rate of an employee is called __?__.
3. An amount of money, often calculated as a percent, given to someone for service they provide is called a(n) __?__.
4. A fixed amount of pay for a week or a month is called __?__.
5. Salespeople who receive a specific percent of the sales they make are paid on (a, an) __?__ basis.
6. One number that represents a group of numbers is called a(n) __?__.
7. Time worked beyond the end of a usual working day is called __?__.
8. A wage rate based on the amounts produced by an employee is called __?__.
9. Employees that are paid a fixed amount daily are called __?__ employees.

average
commission
double-time pay
employee
employer
graduated commission
gross pay
hourly rate
overtime
piece-rate
per diem
quota
salary
straight commission
time-and-a-half pay
tip

1-1 Hourly Pay

10. Raphael Winston is paid $15.60 for each hour he works. What is his gross pay for a week in which he works 43 hours?
11. Monique Valla is paid an hourly rate of $17.63 for regular-time work. What will be her time-and-a-half and double-time hourly pay rates for overtime work?
12. Raul Pina worked these hours in five days: $8\frac{1}{4}$, $7\frac{1}{2}$, 10, $8\frac{3}{4}$, and 8 hours. Overtime is based on an 8-hour workday. How many regular hours and overtime hours did he work in the five days?
13. Penelope Schoenberg's overtime is figured on a 40-hour week. Last week she worked 45.6 hours. This week she worked 9.7 hours on Monday, 8.3 hours on Tuesday, 8 hours on Wednesday, 9.1 hours on Thursday, and 8.6 hours on Friday. How many overtime hours did she work in the two weeks?
14. Eddie Fantin is paid every two weeks. For the first week of his pay period he worked 42 hours, 4 of which were overtime hours. In the second week he worked 40 regular hours and 7 overtime hours. His regular pay rate is $14.40 an hour with time-and-a-half for overtime. What are his regular, overtime, and total wages for the two weeks?

1-2 Salary

15. Karolyn Yoder is paid a salary of $4,600 a month. What are her total annual earnings?

16. Marcel Ouimet earns a salary of $30,000 per year. What is his monthly salary?

17. Jason Kimee earns $450 per week. His boss gives him a raise of $30 per week. How much more will Jason earn per year at his new salary?

1-3 Commission

18. Gaston Kohl is paid a straight commission of 6.5% on all sales. In March his sales were $105,000. What were his commission earnings in March?

19. A company pays sales staff a monthly commission of 4% on the first $15,000 of sales, 6% on the next $20,000 of sales, and 7.5% on all sales above $35,000. What amount would Tony Renshaw earn if his sales for a month were $41,000?

20. Irene Ogan earned a commission of $5,130 on sales of $90,000. What rate of commission was she paid?

21. Doris Bommarito is paid a commission of 1.4% on all monthly sales above $80,000. Her sales for November were $382,000. What commission amount did she earn for the month?

1-4 Other Wage Plans

22. Steven Kahn is paid $4.25 for each wooden duck he paints that passes inspection. What is his pay on a day when he paints 38 ducks, 2 of which were rejected?

23. Tammy Scott-Hogan charges $350 a day to develop a personal training program for her clients. What amount did she earn last month if she worked 17 days?

24. What tip will Brady get if a customer adds a 15% tip to his $18.52 meal cost?

25. Amanda delivers newspapers to subscription customers. She receives an average annual tip of $12 from her 156 customers. What is her tip income for the year?

1-5 Average Pay

26. The gross earnings of 6 employees in a picture framing shop for a week were: $620, $524, $715, $670, $588, and $675. What was the average amount earned for the week by these employees?

27. For the 9 warmest months of the year Kendrick Beachom installed chain link fences and earned $3,500 a month. For the remaining 3 months of the year he earned these monthly amounts by working several part-time jobs: $2,450, $1,785. $3,025. What were his average monthly earnings for the year?

28. The average annual pay of 4 construction workers is $46,800. Three of the workers earned these annual amounts of pay: $44,200; $47,450; and $45,900. What was the annual pay of the fourth worker?

29. Sol Levin sold 22 pairs of shoes each day, Monday through Wednesday, 28 pairs on Thursday, and 31 on Friday. How many shoes must he sell on Saturday to average 29 pairs sold for the 6 days he worked during the week?

Technology Workshop

Task 1 Enter Data into a Payroll Detail Template

You are to complete a template that calculates the weekly gross wages for each employee of the Bainbridge Company. All employees receive regular hourly pay for time worked and overtime pay for hours worked beyond 40 hours in a week.

Open the spreadsheet for Chapter 1 (tech1-1.xls). Next, enter into the spreadsheet the hours worked by each employee for the three days shown in blue cells (cells G5-I14). The spreadsheet will calculate regular, overtime, and total gross wages for each employee. When finished, your spreadsheet should look like the one shown below.

	A	B	C	D	E	F	G	H	I	J	K	M	N	O	P
1	Bainbridge Company														
2	Payroll Detail Sheet for January 8, 20—														
3	Employee		Daily Hours Worked							Total Hours		Hourly	Gross Wages		
4	No.	Name	M	T	W	T	F	S	S	Reg	O.T.	Rate	Reg	O.T.	Total
5	1	Ajanaku	8.00	8.00	7.80	8.00	8.00	0.00	0.00	39.80	0.00	10.46	416.31	0.00	416.31
6	2	Bell	8.00	8.00	4.50	8.00	8.00	0.00	0.00	36.50	0.00	11.15	406.98	0.00	406.98
7	3	Cole	8.00	10.00	10.00	10.00	8.10	0.00	0.00	40.00	6.10	12.23	489.20	111.90	601.10
8	4	Dern	7.70	8.00	8.00	8.00	8.00	4.10	2.00	40.00	5.80	10.15	406.00	88.31	494.31
9	5	Evers	8.00	9.80	8.10	8.00	8.00	0.00	0.00	40.00	1.90	12.85	514.00	36.62	550.62
10	6	Ford	7.10	8.00	8.00	8.00	8.00	4.10	0.00	40.00	3.20	10.46	418.40	50.21	468.61
11	7	Gomez	8.00	8.00	8.00	8.00	8.00	3.90	2.00	40.00	5.90	12.35	494.00	109.30	603.30
12	8	Huang	8.00	9.30	8.00	8.00	8.00	0.00	0.00	40.00	1.30	11.70	468.00	22.82	490.82
13	9	Isom	8.00	8.00	5.40	8.00	8.00	0.00	0.00	37.40	0.00	11.32	423.37	0.00	423.37
14	10	Jackson	8.00	8.00	10.00	8.10	8.40	0.00	0.00	40.00	2.50	13.20	528.00	49.50	577.50
15		Totals											4,564.26	468.66	5,032.92
16															
17										Pay Raise Factor		1.000			

Task 2 Analyze the Spreadsheet Output

Answer these questions about your completed payroll sheet.

1. What hourly pay rate did Dern have?
2. Which employee had the largest gross pay for the week?
3. Which employee worked the least regular-time hours?
4. Which employee worked the most overtime hours?
5. What was the total amount paid to all employees for overtime work?
6. What total gross pay was paid to employees for the one-week pay period?

Now move the cursor to cell M17, labeled Pay Raise Factor. The current entry in the cell should be 1.000. Now enter 1.021. This change shows what would happen if the Bainbridge Company gives its employees a 2.1% pay increase. The increase would raise wages to 102.1%, or 1.021, of their current level. Notice how the hourly rate and the regular, overtime, and total gross wages figures changed for all workers.

Answer these questions about your updated payroll sheet.

7. What is the formula used in Cell N5? What does the formula calculate?
8. What is the formula used in Cell O7? What arithmetic is done in the cell?
9. What is the formula used in Cell P12? What does it do?
10. What hourly rate does Dern now earn? How much more per hour is Dern paid after the raise was calculated?
11. Find the difference between the original and the new total gross wages, then calculate the percent increase to the nearest tenth percent. What does your answer show?

Task 3 Design a Sales Commission Spreadsheet

You are to design a spreadsheet that will compute the monthly earnings of salespersons that are paid monthly on a graduated commission basis.

The spreadsheet for Task 1 includes formulas that use subtraction, multiplication, the IF function, and the SUM function. Create a spreadsheet that will use similar math operators and functions. The spreadsheet should allow you to calculate the gross pay for a month for all employees listed. Your spreadsheet should contain a row for each employee. The column formulas should calculate the amount of commission earned by each employee for each commission level and the total gross wages for all employees.

SITUATION: You are the payroll clerk in the office of the Betadyne Company. The company pays its salespeople a commission on their sales. It does not pay them any salary. The employee names and their April sales are shown below on the left. Shown below on the right are the sales levels and rates by which your company figures commission payments.

Salesperson	April Sales
Boyce, Thad	$53,000
Elkins, James	$48,000
Kubik, Lucy	$92,000
Mays, Nora	$64,000

Betadyne Company Commission Structure
1.5% on all sales
3.4% on the first $50,000 of sales
4.6% on all sales above $50,000

Task 4 Analyze the Spreadsheet Output

Answer these questions about your completed spreadsheet.

12. How did you figure the commission on all sales?
13. How did you test the spreadsheet to make sure the calculations were correct?
14. How would you change the spreadsheet to calculate the average gross commissions earned by employees?

Chapter Assessment

Chapter Test

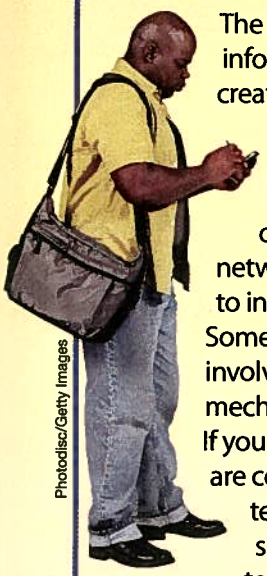
Answer each question.

1. Add: $8\frac{1}{4} + 9 + 7\frac{1}{2} + 8 + 10\frac{1}{4}$
2. Subtract: $47.3 - 37.5$
3. Multiply: $38\frac{3}{4} \times \$13.35$.
4. Divide: $\$85{,}956 \div 52$
5. Rewrite 1.0567 as a percent.
6. $30 \div \frac{5}{8} = ?$
7. What is 1.25% of \$34,500?
8. 120 is $\frac{1}{4}$ greater than what number?
9. Write 5.68% as a decimal rounded to the nearest hundredth.
10. Round \$0.8794 to the nearest cent.
11. What number increased by 20% of itself equals \$103.20?

Solve.

12. Fiona Wolfe was paid \$9 an hour for 46 hours of work last week at her full-time job. She also worked 7 hours last week at a part-time job that pays \$11 an hour. What total gross pay did she earn last week from both jobs?
13. Zygmund Oleksik is paid a salary of \$800 a week to manage a party store. What amount will he make in one year working at this job?
14. Rosie Belin worked these total weekly hours in four weeks of work: 45, 38, 42, 43. Her job pays \$14 for each hour she works. What average gross pay did she earn per week for these four weeks of work?
15. The six employees in the security department of a company average \$120 gross pay a day. Three of the employees earn \$125 per day. Two others earn \$116.50 a day. How much does the sixth employee earn per day?
16. Frank Camp's regular hourly pay rate is \$11.87 an hour. His overtime pay rate is time-and-a-half. How much is Frank paid per hour for overtime work?
17. Justine Gilbert worked these hours last week: Monday, 8; Tuesday, $10\frac{1}{4}$; Wednesday, $8\frac{1}{2}$; Thursday, 9; Friday, $7\frac{3}{4}$. She works on an 8-hour day with time-and-a-half being paid for overtime work. Her regular gross pay rate is \$17.10 an hour. What was Justine's overtime pay amount for last week?
18. Barney Mullins' regular pay rate is \$14.85 an hour. He is paid time-and-a-half for hours worked over 40 hours in a week, including weekend work. He worked these hours from Monday through Saturday last week: 8.2, 8.9, 10.1, 9.6, 8.8, 6.7. What was his gross pay for the week?
19. Tiffany Penfield is paid a salary of \$750 a month at her sales job. She also earns a commission on her sales in this way: 2% on all sales up to \$34,000 in a month and 8% on all higher sales. What were Tiffany's total earnings for a month where her total sales were \$80,000?
20. All employees of the Crafton Company are paid \$0.375 for each wrench set they pack. How much would Kenny Pace earn if he packed 1,740 wrench sets in one week of work?

Planning a Career in Information Technology



Photodisc/Getty Images

The opportunities that exist in information technology range from creating web pages and computer programs to the installation and repair of computer equipment. Many of these jobs are in businesses or government, where computer networks are installed and monitored to increase effectiveness and efficiency. Some positions in information technology involve creativity while others require mechanical and electrical expertise. If you are good at problem solving, are comfortable with cutting-edge technology, and work well with little supervision, a career in information technology may be for you.

Job Titles

- Computer programmer
- Network administrator
- Computer support specialist
- Technical writer
- Web designer
- Computer scientist
- Telecommunications equipment installer
- Computer software engineer
- Technical writer

Needed Skills

- Excellent computer and technology skills
- Ability to work independently, as well as with others
- Outstanding problem solving skills
- Strong mathematical and science skills
- Vivid imagination, creativity, and exceptional writing talent
- Assessment and decision making skills

What's it Like to Work in Computer Programming?

Computer programmers write programs for computers to follow to perform specific functions. Programmers usually translate a design for a computer program by coding the design into a programming language that the computer can understand. There is more than one programming language and computer programmers generally know more than one. Computer programs are written for the payroll industry, the financial industry, the entertainment industry, and many other industries. After the programmer writes the specific instructions for the program, the programmer is responsibly for testing, maintaining, and improving the program.

What About You?

What aspect of computer programming appeals to you? How might you best prepare for a career in this field?

How Times Have Changed

For Questions 1–2, refer to the timeline on page 3 as needed.

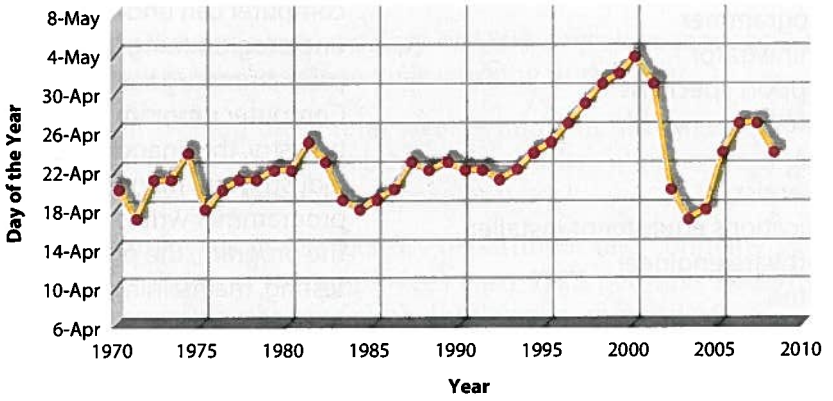
1. Opponents to increases in minimum wage believe that by increasing the wage, jobs will be lost because small business cannot afford to keep workers at a higher rate. Suppose a full-time worker who earns minimum wage in 1997 receives the increases enacted in 2007, 2008, and 2009. How much more per week will the company have to pay her at the new rate in 2007 than 1997? How much more will they pay in 2008 than 2007? How much more will they pay in 2009 than 2008?
2. How much does a full-time minimum wage worker that works 52 weeks a year earn annually at the 2007 minimum wage rate? the 2009 rate?

Chapter 2

Net Pay

Statistical Insights

Tax Freedom Day



Source: www.taxfoundation.org

If American workers applied every dollar earned beginning January 1 to pay the government their annual tax obligations, all their taxes would be paid by a day in April or May. This day is referred to as Tax Freedom Day and varies from year to year. The line graph above has 39 points; one for each year from 1970 to 2008. Use the graph to answer Questions 1–5.

1. What year did Americans work the greatest number of days to pay their tax burden?
2. What two years did Americans work the least number of days to pay their tax burden?
3. Recent tax stimulus packages have resulted in Tax Freedom Day arriving earlier in the year. Which four recent years appear to be years with these tax cuts?
4. What day was Tax Freedom Day the year you were born?
5. **Explain** why the Tax Freedom Day continues to fall within the same four weeks of the year as it did in the 1970s.

How Times Have Changed

Social Security was created to keep older Americans out of poverty. It is not an insurance policy or savings account; the money deposited today is used to pay benefits today. In 1950, there were about 16 workers to cover one Social Security beneficiary. Today, there are about 3.3 workers for each beneficiary. It is predicted that by about 2042, Social Security will run out of funds.

1935 — **1935** Congress enacts the Social Security Act to provide benefits to persons 65 years and older.

1937 The Federal Insurance Contribution Act (FICA) requires workers to contribute to the Social Security system.

1939 Coverage was expanded to include dependents and survivors.

1950

1956 Coverage was expanded to include disabled workers.

1965

1966 Medicare was created to provide health insurance to people 65 years and older.

1972 Automatic cost-of-living adjustments (COLAs) were introduced.

1973 Payroll taxes for Social Security and Medicare go from 5.2% to 5.85%, the single greatest increase in its history.

1975

1990 Payroll taxes for Social Security and Medicare go from 7.51% to the current 7.65%.

1990

1993 The amount of taxable Social Security benefits increases to 85% for higher-income retired workers.

1996 Social Security is predicted to have a shortfall beginning in 2012.

2000

Research the significant event that occurred in 2000 that affected the benefits that retired workers receive.

2005

2018 The benefits that Social Security pays out are predicted to exceed the amount collected.

2020

2042 The fund is predicted to be out of money, if changes are not made to the plan.

NET Bookmark

The U.S. Department of Social Security web site provides information about Social Security benefits. Access **www.cengage.com/school/business/businessmath** and click on the link for Chapter 2. You can calculate your benefits under the retirement heading. What three types of calculators are offered? Besides retirement, what other reasons might a person have to use one of these calculators?

2-1

Deductions from Gross Pay

GOALS

- Find federal withholding tax deductions
- Calculate Social Security and Medicare tax deductions
- Calculate total deductions and net pay

KEY TERMS

- deduction
- withholding tax
- withholding allowance
- net pay

Start Up ▶▶▶

Janice is single and has just graduated from community college. She needs at least $480 each week to pay for her rent and other living expenses to afford to live alone. If she earns $13 an hour and works 40 hours each week, will she earn enough to pay her expenses?

Photodisc/Getty Images

Math Skill Builder

Review these math skills and solve the exercises that follow.

1 **Add** money amounts. Find the sum.
$35.62 + $12.65 + $87.61 + $27.59 = $163.47

1a. $77.12 + $18.92 + $40.56 + $9.21

1b. $53.07 + $3.76 + $21.98 + $82.16

2 **Subtract** money amounts from money amounts. Find the difference. $540.09 − 62.72 = $477.37

2a. $3,145.00 − $809.12

2b. $723.82 − $129.04

2c. $235.88 − $13.48

3 **Rewrite** percents as decimals.
Rewrite 7.52% as a decimal. 7.52% = 0.0752

3a. 4% **3b.** 5.2% **3c.** 10.5% **3d.** 4.34%

4 **Multiply** money amounts by percents and round the product to the nearest whole cent.
Find the product. $387.25 × 7% = $387.25 × 0.07 = $27.1075, or $27.11

4a. $1,249.00 × 4%

4b. $478.53 × 7.2%

4c. $809.42 × 1.45%

Math *Tip*

To rewrite a percent as a decimal, move the decimal point two places to the left and drop the percent sign.

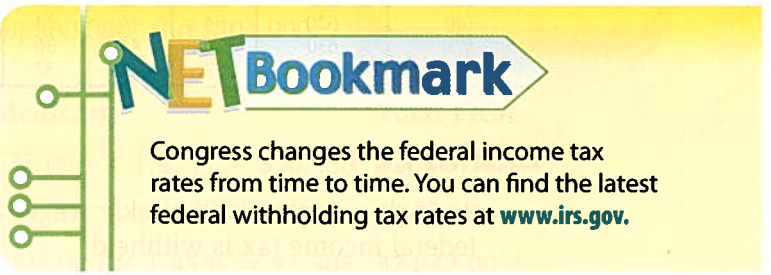
Federal Withholding Tax Deduction

Deductions are subtractions from gross pay. The federal government, as well as many states and cities, require employers to deduct money from employee wages for income taxes, or **withholding taxes**, plus Social Security and Medicare taxes.

The amount of withholding tax depends on a worker's wages, marital status, and number of withholding allowances claimed. A **withholding allowance** is used to reduce the amount of tax withheld. Workers may claim one withholding allowance for themselves, one for a spouse, and one for each child or dependent.

To find the amount withheld from a worker's wages, you can use an income tax withholding table prepared by the government. Use the tables shown to find federal withholding taxes on weekly wages.

First determine whether the person is single or married. Then, using the table for the employee's marital status, read down the *if the wages are*—column at the left until you reach the correct wage line. Next, read across to the column headed by the number of withholding allowances claimed by the employee.



Single Persons—Weekly Payroll Period

(For Wages Paid in 2008)

If the wages are—		And the number of withholding allowances claimed is—										
At least	But less than	0	1	2	3	4	5	6	7	8	9	10
		The amount of income tax to be withheld is—										
350	360	38	28	18	10	3	0	0	0	0	0	0
360	370	40	30	20	11	4	0	0	0	0	0	0
370	380	41	31	21	12	5	0	0	0	0	0	0
380	390	43	33	23	13	6	0	0	0	0	0	0
390	400	44	34	24	14	7	1	0	0	0	0	0
400	410	46	36	26	15	8	2	0	0	0	0	0
410	420	47	37	27	17	9	3	0	0	0	0	0
420	430	49	39	29	18	10	4	0	0	0	0	0
430	440	50	40	30	20	11	5	0	0	0	0	0
440	450	52	42	32	21	12	6	0	0	0	0	0
450	460	53	43	33	23	13	7	0	0	0	0	0
460	470	55	45	35	24	14	8	1	0	0	0	0
470	480	56	46	36	26	16	9	2	0	0	0	0
480	490	58	48	38	27	17	10	3	0	0	0	0
490	500	59	49	39	29	19	11	4	0	0	0	0
500	510	61	51	41	30	20	12	5	0	0	0	0
510	520	62	52	42	32	22	13	6	0	0	0	0
520	530	64	54	44	33	23	14	7	0	0	0	0
530	540	65	55	45	35	25	15	8	1	0	0	0
540	550	67	57	47	36	26	16	9	2	0	0	0

Married Persons—Weekly Payroll Period

(For Wages Paid in 2008)

If the wages are—		And the number of withholding allowances claimed is—										
At least	But less than	0	1	2	3	4	5	6	7	8	9	10
		The amount of income tax to be withheld is—										
440	450	29	22	16	9	2	0	0	0	0	0	0
450	460	30	23	17	10	3	0	0	0	0	0	0
460	470	32	24	18	11	4	0	0	0	0	0	0
470	480	33	25	19	12	5	0	0	0	0	0	0
480	490	35	26	20	13	6	0	0	0	0	0	0
490	500	36	27	21	14	7	0	0	0	0	0	0
500	510	38	28	22	15	8	1	0	0	0	0	0
510	520	39	29	23	16	9	2	0	0	0	0	0
520	530	41	31	24	17	10	3	0	0	0	0	0
530	540	42	32	25	18	11	4	0	0	0	0	0
540	550	44	34	26	19	12	5	0	0	0	0	0
550	560	45	35	27	20	13	6	0	0	0	0	0
560	570	47	37	28	21	14	7	1	0	0	0	0
570	580	48	38	29	22	15	8	2	0	0	0	0
580	590	50	40	30	23	16	9	3	0	0	0	0
590	600	51	41	31	24	17	10	4	0	0	0	0
600	610	53	43	33	25	18	11	5	0	0	0	0
610	620	54	44	34	26	19	12	6	0	0	0	0
620	630	56	46	36	27	20	13	7	0	0	0	0
630	640	57	47	37	28	21	14	8	1	0	0	0

EXAMPLE 1

A single receptionist's weekly wages are $380 with 1 withholding allowance. What federal income tax is withheld?

SOLUTION

Use the table for single persons. The wages, $380, are on the fourth line of this part of the table. Read across to find the column under 1 withholding allowance. The amount of tax is $33.

CHECK YOUR UNDERSTANDING

A. Jared Brown is a single hospital technician with weekly wages of $458. He claims 1 withholding allowance. What amount should be deducted from his wages for federal withholding taxes?

B. Imy Berstein is a married worker earning $514 each week. She claims 2 withholding allowances. What amount should be deducted from her weekly earnings for federal withholding taxes?

Social Security and Medicare Tax Deductions

The tax for Social Security is part of the Federal Insurance Contributions Act and is also called the FICA tax. The FICA benefits include:

Photodisc/Getty Images

- *disability benefits* for workers who are disabled and unable to work
- *Medicare,* which provides hospital insurance for some disabled people and for people over 65
- *retirement benefits* for people who are at least 62
- *survivors' benefits,* which are paid to spouses and dependent children when a Social Security recipient dies

FICA tax rates and the maximum wages on which the taxes are charged are set by Congress and may change from time to time.

The overall tax rate of 7.65% is used in this text. This rate is made up of the Social Security tax rate of 6.2% applied to a maximum wage of $102,000 and the Medicare tax rate of 1.45%, applied to all wages.

If a person earns more than $102,000 a year from one job, the employer does not deduct Social Security tax after the wages exceed $102,000. If a person earns more than $102,000 a year from several jobs, each employer withholds 6.2% Social Security tax to the maximum $102,000 earning limit. The taxpayer must apply for a return of the overpayments when a federal income tax return is filed.

Business *Tip*

People who work for themselves must also pay FICA taxes on yearly net earnings. The tax rates for the self-employed are twice the rates paid by employees because the self-employed person must pay the employee and employer shares.

EXAMPLE 2

Find the total FICA tax on incomes of $35,000, $80,000, and $104,000.

SOLUTION

Income	Social Security	Medicare	Total FICA
$35,000	$35,000 × 6.2% = $2,170	$35,000 × 1.45% = $507.50	$2,677.50
$80,000	$80,000 × 6.2% = $4,960	$80,000 × 1.45% = $1,160	$6,120.00
$104,000	$102,000 × 6.2% = $6,324	$104,000 × 1.45% = $1,508	$7,832.00

✔ CHECK YOUR UNDERSTANDING

Find the FICA tax on each income.

C. $24,000 **D.** $110,000

FICA taxes owed by workers are collected by their employers. Employers deduct the tax from each employee's earnings. Employers must also pay a FICA tax equal to the FICA taxes they deduct from their employees' earnings.

Math *Tip*

If an employee has not exceeded the $102,000 limit, another way to find the total FICA tax is to multiply the income by the combined Social Security and Medicare rate of 7.65%

$35,000 × 7.65% = $2,677.50

$80,000 × 7.65% = $6,120.00

$104,000 has exceeded the $102,000 limit, so the separate rates must be used.

EXAMPLE 3

Sarah Fellows earned $562 during the last week of January. Find the total FICA taxes her company deducted from her wages.

SOLUTION

Since Sarah's wages are paid in January, you are sure that her wages have not exceeded the Social Security earning limit. She is taxed on both Social Security and Medicare. Use 7.65% as the tax rate.

7.65% = 0.0765 Rewrite as a decimal.

$562 × 0.0765 = $42.993 Multiply the weekly wages by the decimal rate.

The total FICA tax amount deducted from Sarah's wages was $42.99.

✔ CHECK YOUR UNDERSTANDING

Find the total FICA tax amount on each weekly wage.

E. $460 **F.** $712.44

G. $1,087.30 **H.** $375.88

Calculator Tip

On many calculators, you can multiply by a percent directly without rewriting it as a decimal. For example, to calculate $460 multiplied by 7.65 percent, enter 460, press ×, then enter 7.65, and press %. The answer 35.19 will appear in the calculator display.

Total Deductions and Net Pay

In addition to withholding, Social Security, and Medicare taxes, other deductions may also be subtracted from gross pay, such as union dues, health and life insurance, and government bonds. After all deductions are subtracted from total wages, or gross pay, an amount remains that is called **net pay**, or *take-home pay.*

Net Pay = Gross Pay − Deductions

Statement of Employee Earnings and Payroll Deductions

	EARNINGS			DEDUCTIONS							
WEEK ENDED	REGULAR	OVER-TIME	TOTAL	FED. WITH.	SOC SEC.	MEDI CARE.	LIFE INS.	HEALTH INS.	OTHER	TOTAL	NET PAY
2/4	*375.00*		*375.00*	*31.00*	*23.25*	*5.44*	*12.50*	*56.45*	*13.75*	*144.39*	*232.61*

NO. 4798

EXAMPLE 4

Mary Mendosa earned a gross pay of $426 last week. Federal withholding taxes of $39, Social Security taxes of 6.2%, Medicare taxes of 1.45%, health insurance premiums of $45.80, and union dues of $12.56 were deducted from her gross pay. Find Mary's net pay.

SOLUTION

Multiply the gross pay by each tax rate.

$426 × 0.062 = $26.41 $426 × 0.0145 = $6.18

$39 + $26.41 + $6.18 + $45.80 + $12.56 = $129.95 total deductions

$426.00 − $129.95 = $296.05 Subtract the total deductions from gross pay.

Mary Mendosa's net pay for the week was $296.05.

✔ CHECK YOUR UNDERSTANDING

I. Jay Panetta earned gross pay of $410 last week. From his gross pay the following were subtracted: federal withholding tax, $37; Social Security tax, 6.2%; Medicare tax, 1.45%; health insurance, $34.88; and $40 for his savings plan. Find Jay's net pay.

J. Last week, Rose Petropolis earned gross pay of $820. Her employer deducted $109 in federal withholding taxes, 6.2% in Social Security taxes, 1.45% in Medicare taxes, $74 in health insurance, and $45 in union dues. What was Rose's net pay?

Wrap Up ▶ ▶ ▶

Janice earns \$520 a week (\$13/hr × 40 hr). Using the federal withholding tax table for single persons with 1 withholding allowance, her tax on \$520 is \$54. In addition, Social Security taxes are \$32.24 and Medicare taxes, \$7.54. Even if she had no other deductions from her gross pay, her net pay is only \$426.22. This amount is not enough to cover the \$480 she needs to live alone.

Exercises

Find the sum.

1. \$34 + \$15.23 + \$65.01 + \$23.85

2. \$87 + \$32.71 + \$48.14 + \$12.09

Find the difference.

3. \$523.19 − \$106.42

4. \$4,456.12 − \$98.76

5. \$389.28 − \$79.52

6. \$2,107.88 − \$278.43

Rewrite percents as decimals.

7. 8%

8. 2.4%

9. 12.06%

10. 3.67%

11. 89.145%

12. 145%

Find the product.

13. \$498 × 5.6%

14. \$826 × 3.456%

Find the withholding tax in each exercise using the tables given.

Total Wages	Marital Status	Withholding Allowances	Total Wages	Marital Status	Withholding Allowances
15. \$390.00	Single	1	**16.** \$487.00	Married	2
17. \$411.00	Single	0	**18.** \$444.00	Single	4
19. \$528.97	Married	5	**20.** \$612.81	Married	3
21. \$457.07	Single	1	**22.** \$438.88	Single	9

Find the Social Security tax and Medicare tax on each weekly wage. Use a 6.2% Social Security tax rate on a maximum of \$102,000 gross wages and a 1.45% Medicare tax rate on all wages.

23. \$475.00

24. \$556.34

25. \$249.40

26. \$497.45

27. \$749.23

28. \$180.04

29. \$289.48

30. \$863.78

Copy and complete the table below. Use a 6.2% Social Security tax rate on a maximum of $102,000 gross wages and a 1.45% Medicare tax rate on all wages.

	Name	Allow-ances	Marital Status	Gross Wages	Income Tax	Social Secur.	Medi-care	Other	Total Deduc.	Net Wages
31.	Ahern	1	Single	$467.29				$82.12		
32.	Brown	0	Single	$399.62				$56.45		
33.	Cali	3	Married	$578.21				$31.51		
34.	Devon	6	Married	$459.65				$75.21		
35.	Ezeka	2	Married	$538.76				$48.22		

Ali Zaheer is married with 3 withholding allowances. Each week his employer deducts federal withholding taxes, Social Security taxes, Medicare taxes, and $38.12 for health insurance from his gross pay. His gross weekly wage is $578.

36. Find the total deductions

37. Find his net pay.

Photodisc/Getty Images

Josh Logan is paid a monthly salary of $8,700.

38. Estimate his Social Security taxes for May.

39. Find the exact Social Security taxes he paid for the month of March.

40. Find the Social Security taxes he paid in December.

41. What Medicare taxes did he pay for the year?

Rachel Radcliff earns an annual salary of $126,000.

42. How much Social Security taxes will be deducted from her salary in November?

43. How much Social Security taxes will be deducted from her salary in May?

44. How much Medicare taxes will be deducted from her salary for the year?

45. **CRITICAL THINKING** What is the relationship between income, tax, and the number of withholding allowances? Why would less money be taken out when more allowances are claimed?

46. **FINANCIAL DECISION MAKING** Your employer allows you to deduct money each week from your gross wages to be placed in a savings plan of your choice. Should you have this deduction taken from your wages each week?

Mixed Review

47. $\$25.60 \times 1\frac{1}{4}$

48. $\frac{1}{4} + 6\frac{3}{4} + 8\frac{1}{2}$

49. $5\frac{1}{4} - 3\frac{1}{2}$

50. $\$8 \times 0.1$

51. $\frac{1}{4}$ more than 40

52. $\$25{,}600 \times 12.5\%$

2-2

Federal Income Taxes

GOALS

- Calculate adjusted gross income and taxable income
- Calculate the income tax due
- Calculate the income tax refund for single dependents

KEY TERMS

- gross income
- adjusted gross income
- taxable income
- deduction
- standard deduction
- exemption

Start Up ▶ ▶ ▶

Sven Tole is a high school student who worked during summer vacation. He noticed that federal income taxes were withheld from his paychecks. He didn't think it was fair for him to pay taxes when he made so little during the year. Is he right?

Photodisc/Getty Images

Math Skill Builder

Review these math skills and solve the exercises that follow.

1. **Add** money amounts.
Find the sum. $2,509 + $1,090 + $56 + $398 = $4,053

1a. $1,907 + $3,763 + $78 + $189 **1b.** $5,007 + $208 + $976 + $92

2. **Subtract** money amounts.
Find the difference. $32,459 − $4,108 = $28,351

2a. $3,766 − $791 **2b.** $28,067 − $1,448 **2c.** $107,390 − $65,288

3. **Multiply** money amounts.
Find the product. $2,600 × 2 = $5,200

3a. $2,789 × 4 **3b.** $3,188 × 6 **3c.** $1,572 × 10

Adjusted Gross Income and Taxable Income

Employers deduct money for federal income tax from worker's pay. This is called *a withholding tax.* The amounts withheld are estimates of the tax owed at year's end.

The tax year for individuals ends on December 31. You must calculate and pay any federal income tax due by April 15 of the next calendar year. Income earned and taxes due are reported on *a federal income tax return.*

A completed return shows how much you owe in federal income taxes. If the amount withheld from wages was larger than what was owed, you should claim a refund. If the withholding taxes paid were less than what you owed, you pay the difference.

Business Tip

Self-employed people must estimate their income taxes for the year. They then pay part of that estimated tax each quarter.

Gross income is the total income in a year and includes income from wages, salaries, commissions, bonuses, tips, interest, dividends, prizes, pensions, the sale of stock, and profit from a business.

From gross income, you may be eligible to subtract *adjustments to income.* These include business losses, payments to approved retirement plans, alimony, and certain penalties. The amount left is called **adjusted gross income**.

Adjusted Gross Income = Gross Income − Adjustments to Income

From adjusted gross income you subtract the deductions and exemptions for which you qualify. The result is your taxable income. **Taxable income** is the income on which you actually pay tax.

Taxable Income = Adjusted Gross Income − Deductions and Exemptions

Deductions are expenses that reduce the amount of your taxable income. You may deduct interest paid on a home mortgage, property taxes, state and local income taxes, medical and dental expenses, casualty and theft losses, and contributions to charities. You may claim a fixed amount called a **standard deduction**. Or, if your actual deductions are more than the standard deduction, you list all your deductions on your tax return under *itemized deductions.*

An **exemption** is an amount of income per person that is free from tax. You may claim one exemption for yourself unless you are claimed as a dependent on another person's tax return. You can also claim one exemption for a spouse and one exemption for each dependent. For example, a couple with two dependent children can claim four exemptions. A single person with a dependent parent can claim two exemptions.

The amounts allowed for the standard deduction and exemptions change often. In this text, the standard deduction is $5,450 for a person filing an income tax return as an individual and $10,900 for married people filing a return together, *or jointly.* The amount used for each exemption is $3,500.

EXAMPLE 1

Find each person's taxable income.

a. Clara Shane is single and has a gross income of $32,600. She pays $2,600 into an approved retirement plan. Clara has deductions of $6,900. She has one exemption for herself.

b. Andy Cross and his spouse have a gross income of $33,000. They file jointly. They make payments into an approved retirement plan of $3,000. Their itemized deductions were only $4,300. So, they will take the standard deduction of $10,900. They claim two exemptions.

SOLUTION

	a. Clara Shane	b. The Crosses
Gross Income	$32,600	$33,000
Adjustments to Income	− 2,600	− 3,000
Adjusted Gross Income	$30,000	$30,000
Deductions	− 6,900	−10,900
	$23,100	$19,100
Exemptions	− 3,500	− 7,000
Taxable Income	$19,600	$12,100

✔CHECK YOUR UNDERSTANDING

A. Tyronne Gilkey is single and has an adjusted gross income of $65,000. Tyronne has deductions of only $2,900, and so he decides to take the standard deduction. He claims one exemption for himself. What is his taxable income?

B. Alice Greer and her spouse have an adjusted gross income of $50,000. They file jointly. Their itemized deductions are $11,500 and they claim three exemptions. What is their taxable income?

Income Tax Due

Employers withhold money for income taxes from employee paychecks during the year. The amount of tax paid in withholding is an estimate and is probably more or less than the tax the employee actually owes.

To find the tax due, you must complete a tax return. If too much withholding or self-employment tax has been paid, the government will pay back, or *refund* the difference. If too little tax has been paid, you must pay the difference to the government. If taxable income is less than $100,000, a tax table must be used to find the tax. Parts of a recent tax table are shown below.

If line 43 (taxable income) is—		And you are—			
At least	But less than	Single	Married filing jointly *	Married filing separately	Head of a household
		Your tax is—			
13,000					
13,000	13,050	1,563	1,303	1,563	1,394
13,050	13,100	1,570	1,308	1,570	1,401
13,100	13,150	1,578	1,313	1,578	1,409
13,150	13,200	1,585	1,318	1,585	1,416
13,200	13,250	1,593	1,323	1,593	1,424
13,250	13,300	1,600	1,328	1,600	1,431
13,300	13,350	1,608	1,333	1,608	1,439
13,350	13,400	1,615	1,338	1,615	1,446
13,400	13,450	1,623	1,343	1,623	1,454
13,450	13,500	1,630	1,348	1,630	1,461
13,500	13,550	1,638	1,353	1,638	1,469
13,550	13,600	1,645	1,358	1,645	1,476
13,600	13,650	1,653	1,363	1,653	1,484
13,650	13,700	1,660	1,368	1,660	1,491
13,700	13,750	1,668	1,373	1,668	1,499
13,750	13,800	1,675	1,378	1,675	1,506
13,800	13,850	1,683	1,383	1,683	1,514
13,850	13,900	1,690	1,388	1,690	1,521
13,900	13,950	1,698	1,393	1,698	1,529
13,950	14,000	1,705	1,398	1,705	1,536

If line 43 (taxable income) is—		And you are—			
At least	But less than	Single	Married filing jointly *	Married filing separately	Head of a household
		Your tax is—			
23,000					
23,000	23,050	3,063	2,671	3,063	2,894
23,050	23,100	3,070	2,679	3,070	2,901
23,100	23,150	3,078	2,686	3,078	2,909
23,150	23,200	3,085	2,694	3,085	2,916
23,200	23,250	3,093	2,701	3,093	2,924
23,250	23,300	3,100	2,709	3,100	2,931
23,300	23,350	3,108	2,716	3,108	2,939
23,350	23,400	3,115	2,724	3,115	2,946
23,400	23,450	3,123	2,731	3,123	2,954
23,450	23,500	3,130	2,739	3,130	2,961
23,500	23,550	3,138	2,746	3,138	2,969
23,550	23,600	3,145	2,754	3,145	2,976
23,600	23,650	3,153	2,761	3,153	2,984
23,650	23,700	3,160	2,769	3,160	2,991
23,700	23,750	3,168	2,776	3,168	2,999
23,750	23,800	3,175	2,784	3,175	3,006
23,800	23,850	3,183	2,791	3,183	3,014
23,850	23,900	3,190	2,799	3,190	3,021
23,900	23,950	3,198	2,806	3,198	3,029
23,950	24,000	3,205	2,814	3,205	3,036

If line 43 (taxable income) is—		And you are—			
At least	But less than	Single	Married filing jointly *	Married filing separately	Head of a household
		Your tax is—			
0	5	0	0	0	0
5	15	1	1	1	1
15	25	2	2	2	2
25	50	4	4	4	4
50	75	6	6	6	6
75	100	9	9	9	9
100	125	11	11	11	11
125	150	14	14	14	14
150	175	16	16	16	16
175	200	19	19	19	19
200	225	21	21	21	21
225	250	24	24	24	24
250	275	26	26	26	26
275	300	29	29	29	29
300	325	31	31	31	31
325	350	34	34	34	34
350	375	36	36	36	36
375	400	39	39	39	39
400	425	41	41	41	41
425	450	44	44	44	44
450	475	46	46	46	46
475	500	49	49	49	49
500	525	51	51	51	51
525	550	54	54	54	54
550	575	56	56	56	56
575	600	59	59	59	59
600	625	61	61	61	61
625	650	64	64	64	64
650	675	66	66	66	66
675	700	69	69	69	69
700	725	71	71	71	71

To use a tax table, find your taxable income in the "At least ... but less than" columns. Then read across that line to the column that shows the filing status: single, married filing jointly, etc. The amount where that line and column meet is your tax.

EXAMPLE 2

Use the tax tables to find the income tax due and the amount owed or refunded.

a. Bea O'Shea is single, has taxable income of $13,200, and her employer deducted $2,340 in withholding taxes for the year.

b. Vince Tagliani is married and files a joint return. He and his wife had a taxable income of $23,425 last year. The amount withheld from their wages was $2,669 during the year.

SOLUTION

	a. O'Shea	b. Tagliani
Income tax due from table	$1,593	$2,731
Amounts withheld during year	$2,340	$2,669
Tax owed	—	$62
Refund due	$747	—

Business *Tip*

A head of household is an unmarried or legally separated person who pays more than half the cost of keeping a home for a dependent father, mother, or child.

✔ CHECK YOUR UNDERSTANDING

C. Bill Reston is single and has taxable income of $13,576. His employer deducted $1,827 in withholding taxes for the year. Find Bill's tax due and any refund or amount owed.

D. Vera Yates is married and files a joint return. Vera and her spouse had a taxable income of $23,901 last year. The amount withheld from their wages was $2,509 during the year. Find their tax due and refund or amount owed.

Income Tax Refunds for Single Dependents

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Many young, single people, such as students, are listed as dependents on someone else's income tax even though they are employed. They are required to pay income taxes on their earnings, even though the tax they actually owe is usually very low. That means that usually the federal income taxes withheld from their paychecks are greater than the federal income taxes they owe.

To claim a refund on taxes paid, you must file an income tax return. The rules for dependents filing returns are different than for people who are not dependents.

A dependent's income is grouped into two categories: earned income and unearned income. *Earned income* is from the dependent's own labor, such as wages, salaries, and tips. Everything else is *unearned income*, including interest and dividends.

A single dependent who is not blind and under 65 can claim as a standard deduction the higher of these two amounts:

a. $850

b. The amount of earned income, plus $300, up to $5,450 (This is the standard deduction used in this text.)

EXAMPLE 3

Jack Valente is a senior at Bayview High School and his parents claimed him as a dependent on their tax return. Jack worked last summer and earned $2,385. His employer deducted $320 in withholding taxes from his pay. Jack also earned $350 in interest on his savings account and had no adjustments to income. Jack claimed the standard deduction. What was the amount of Jack's refund?

SOLUTION

Find the amount of allowable deduction: $2,385 + $300 = $2,685

Since $2,685 > $850 and $2,685 < $5,450, Jack's allowable deduction is $2,685

Find the amount of adjusted gross income: $2,385 + $350 = $2,735

Find the amount of taxable income: $2,735 − $2,685 = $50

Find the tax due or refund amount: $320 − $6 = $314 Jack's refund

Math *Tip*

The symbol > means greater than. The symbol < means less than.

✔ CHECK YOUR UNDERSTANDING

E. Tina Moore is a junior who earned $3,510 working at a card shop. Her employer deducted $468 in withholding taxes. She has no adjustments to her income or additional income. Her mother claims her as a dependent. How much will Tina receive as a refund?

F. Kim Chung worked for his uncle during the summer. He was paid $2,897 but no withholding tax was deducted. He earned $57 in interest on his savings account. He has no adjustments to his income and his parents claim him on their tax return. How much does he owe in federal income taxes?

Wrap Up ▶ ▶ ▶

Young, single, dependent people, such as students, often have federal income taxes withheld from their paychecks, even though they make very little money during a year. Most will pay only a small amount in income taxes and receive a refund when they file their tax return.

Communication

Write a brief paragraph you might include in an e-mail to a friend who works explaining why it is important for the friend to file a tax return.

There are three important guidelines that should be followed when sending e-mail.

1. Your e-mail should cover only one topic.
2. Your message should be brief.
3. Be courteous and professional in your message.

Remember, once the e-mail is sent, you cannot get it back.

Exercises

Find the sum.

1. $2,683 + $5,094 + $94 + $625
2. $8,262 + $853 + $493 + $77

Find the difference.

3. $4,228 − $735
4. $63,163 − $15,926
5. $73,997 − $16,398
6. $125,370 − $73,920

Find the product.

7. $3,034 × 7
8. $6,517 × 23
9. $2,183 × 7
10. $7,525 × 18

Photodisc/Getty Images

Solve.

11. Bo and Dan Brady's income last year was: net income from business, $35,838.67; dividends, $2,312.98; interest, $3,517.45; rental income, $2,672. Adjustments to income totaled $4,628.83. Find their adjusted gross income.
12. In one year, Nestor Ortiz's wages totaled $29,450. His wife, Maria Gomez had a salary of $31,572 and a bonus of $500. The Gomezes also received $2,519 in interest and $953.37 in dividends. They paid $4,850 into a retirement fund and were penalized $52 for removing money from a savings plan early. What was their adjusted gross income that year?

Dee Goer is single and had an adjusted gross income last year of $16,457. Dee's itemized deductions were $5,452. She claimed one exemption of $3,500.

13. What was Dee's estimated taxable income?
14. What was Dee's actual taxable income?

In preparing their tax return, the Rossinis, a married couple, claimed 5 exemptions at $3,500 each, and the standard deduction. Their adjusted gross income was $45,208.

15. Estimate the Rossini's taxable income.
16. What was the Rossini's exact taxable income?

Use the tax tables in this lesson to find the tax.

17. Beth and Ira Stein are married and file a joint tax return. Their taxable income is $23,378. What is their tax?
18. Nicki O'Shea is 25 years old and is single. Her gross income last year was $21,455 and her taxable income was $13,926. Find her tax.
19. How much tax does a head of household with taxable income of $23,798 owe?
20. Jim Bouche is married but is filing a separate tax return. His taxable income is $23,624. Find the amount of his tax.
21. Tien Chou's tax return for last year shows a total tax of $8,278. Tien's employer withheld $8,450 from her wages during the year. What refund should Tien receive?
22. Kumar Panday paid $16,118 in federal withholding. Kumar's total tax shown on his tax return was $17,448. What amount of tax did he owe?

On his federal income tax return, Benito Silva, a single taxpayer, reported income from wages, $27,820; tips, $5,495; and interest earned, $1,466. Benito had these adjustments to income: payments to a retirement plan, $2,000; penalty for early withdrawal of savings, $19. His employer withheld $3,985 from his pay for federal income tax. Benito claims the standard deduction of $5,450 and an exemption of $3,500.

23. What was Benito's gross income?

24. Find the total of his adjustments to income.

25. Find Benito's adjusted gross income.

26. What was his taxable income?

27. What is his amount of tax due?

28. Does he owe or get a refund? How much?

For Exercises 29–35, assume that each person claims the standard deduction, is under age 65, not blind, had no adjustments to income, and is listed on the parents' return as a dependent. Use the tax tables found in this lesson when needed.

Find each dependent's standard deduction.

	Earned Income	Unearned Income	Standard Deduction		Earned Income	Unearned Income	Standard Deduction
29.	$250	$100		**30.**	$1,950	$600	
31.	$4,875	$300		**32.**	$5,575	$0	

Solve.

33. Last summer, Troy Yaeger earned $2,855. His employer withheld $240 of his wages for income taxes. What is the amount of Troy's tax refund?

34. Carmen Reyes worked part-time last year while attending college and earned $4,288. The total withholding taxes she paid were $450. Carmen also earned $78 in interest and $16 in dividends. How much tax refund should she receive?

35. Jon Kent's parents subtracted $3,500 from their adjusted gross income when they listed him as an exemption on their tax return. Jon's taxable income was $148. He paid $277 in withholding taxes. What amount should he expect as a tax refund?

36. FINANCIAL DECISION MAKING Molly and Dan Shashack claim one less withholding allowance than they are legally entitled to. They do this so that they always get a large refund when they file their federal income tax return. Is this a good idea? Why or why not?

Mixed Review

37. Find 11% of $250.

38. Find $\frac{1}{2}$% of $4,800.

39. 180 is what percent less than 240?

40. What percent of $90 is $270?

41. 432×0.001

42. $9.053 \div 0.001$

43. Jerry Blanchard sells computers. The average price of the computers is $1,248. His rate of commission is $12\frac{1}{2}$%. How many computers would he have to sell to make $624 a week?

2-3

State and City Income Taxes

GOALS

- Calculate state and city income taxes using a flat tax rate
- Calculate state and city income taxes using a graduated tax rate table

KEY TERM

- flat tax

Start Up ▶ ▶ ▶

What are the major uses of city, village, or town taxes in your area? If you live outside a city, village or town, what are the major uses of your county taxes? Make a list of services that your city, village, town, or county provides using tax money.

Photodisc/Getty Images

Math Skill Builder

Review these math skills. Solve the exercises that follow.

1 **Add** money amounts.
Find the sum. $150 + $280 + $450 + $580 = $1,460

1a. $45 + $108 + $289 + $310

1b. $308 + $467 + $589 + $612

2 **Rewrite** percentages as decimals.
Rewrite 5.6% as a decimal. 5.6% = 0.056

2a. 4.7%

2b. 7.14%

2c. 0.8%

2d. 14.9%

3 **Multiply** money amounts by decimals and **round** products to the nearest cent.
Find the product. $54,109 × 0.035 = $1,893.815, or $1,893.82

3a. $24,780 × 0.07

3b. $47,090 × 0.048

3c. $35,100 × 0.127

3d. $249,410 × 0.0345

State and City Flat Income Taxes

Some states and cities tax personal income as a percent of federal taxable income. Some tax personal income as a percent of gross income. Some use a fixed, or **flat tax** rate no matter how much taxable income a person has. That is, the tax rate is the same for every person, regardless of the amount of income they earn in a year.

EXAMPLE 1

Allyson Greve has calculated her federal taxable income to be $45,300. She pays a state income tax rate of 3% on her federal taxable income. Find her state income tax.

SOLUTION

Rewrite the tax rate as a decimal rate:
$3\% = 0.03$

Multiply the federal taxable income by the decimal tax rate: $\$45{,}300 \times 0.03 = \$1{,}359$
Allyson's state income tax is $1,359.

NET Bookmark

Research the list of states with a state income tax. Which state has the highest income tax? Which state has the lowest income tax? Which states have no income tax?

✔ CHECK YOUR UNDERSTANDING

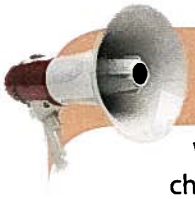
A. LaDonna Traube has to pay a city income tax of 1.5% of her federal taxable income. Last year her federal taxable income was $34,100. What amount of city income tax did she pay?

B. The state in which Angel Soto lives charges a 3.8% income tax based on a person's federal taxable income. If Angel's federal taxable income last year was $29,900, how much state income tax did he pay?

State and City Graduated Income Taxes

Some states and cities use a *graduated* income tax rate like the federal government. In a graduated tax system, the tax rate gets higher as taxable income gets larger. A portion of a graduated tax rate schedule that might be used by a state is shown below.

For taxable income		
Over —	**But not over —**	**The tax is —**
$ -0-	$8,000	2% of taxable income
8,000	16,000	$160 plus 3% of taxable income over $8,000
16,000	24,000	$400 plus 4% of taxable income over $16,000
24,000	32,000	$720 plus 5% of taxable income over $24,000
32,000	40,000	$1,120 plus 6% of taxable income over $32,000
40,000	48,000	$1,600 plus 7% of taxable income over $40,000
48,000	56,000	$2,160 plus 8% of taxable income over $48,000
56,000	64,000	$2,800 plus 9% of taxable income over $56,000
64,000	72,000	$3,520 plus 10% of taxable income over $64,000



Communication

Which do you favor: A flat tax or a graduated tax? Your local government is considering charging an income tax on the taxable incomes of its citizens. Write a letter to your mayor in which you recommend either a flat income tax or a graduated income tax. Your letter should defend your choice of income tax.

EXAMPLE 2

Your taxable income last year was $25,800. Using the graduated income tax table on the previous page, what was your state income tax?

SOLUTION

Find the income ($25,800) in the table shown on the previous page. It is in the column for over $24,000 but under $32,000.

Find the tax on taxable income up to $24,000: $720

Find the taxable income over $24,000: $25,800 − $24,000 = $1,800

Find the tax on $1,800 at a tax rate of 5%: $1,800 × 0.05 = $90

Find the total state income tax on $25,800: $720 + $90 = $810

✔ CHECK YOUR UNDERSTANDING

C. Jennifer Robler's taxable income last year was $43,600. Use the table given on the previous page to find her state income tax.

D. San-li Pyeon had a taxable income last year of $38,200. Using the table given on the previous page, what is his state income tax?

Wrap Up ▶ ▶ ▶

Look back at your list of the uses of local taxes from the beginning of the lesson. Rate the importance of each of the services to you. Place a "1" next to the tax use that is most important to you, a "2" next to the next more important use, and so on.

Exercises

Find the sum.

1. $120 + $270 + $375 + $489

2. $240 + $597 + $812 + $956

Rewrite as decimals.

3. 7.2%

4. 14.7%

5. 24.98%

6. 0.5%

Solve.

7. Renatta Versan pays a city income tax of 3.7% on her taxable income. Her taxable income last year was $58,390. What city income tax amount did she pay?

8. Jason Wiley lives in a state that charges an income tax of 4.52% on all taxable income. Last year Jason's taxable income was $42,189. What state income tax did he pay that year?

Solve.

9. In addition to federal and state income taxes, Rue Lange also has to pay a city income tax. The city income tax rate is $2\frac{1}{2}\%$ of his taxable income. If his taxable income is \$2,345, what is his city income tax?

10. The City of Beacon charges its residents an income tax of $\frac{1}{2}\%$ of their taxable income. Dora Feldman lives in Beacon and has taxable income of \$34,676. What is her city income tax?

For Exercises 11–18 use the graduated tax tables given.

11. Oren Bradley's taxable income last year was \$25,890. What was his state income tax?

12. Lea Kristen's state income tax return shows taxable income of \$39,350. What is the state income tax on that amount?

13. Wayne Delvica's income subject to state income tax is \$22,690. What is his state income tax?

Bill Stark has taxable income of \$26,600. He pays a city income tax of 2% on taxable income in addition to state and federal taxes.

14. What is Bill's city tax?

15. What is his state tax?

16. What is Bill's total city and state tax?

17. Ellen Donald pays city tax of 2.5% on taxable income, in addition to state income tax. Her taxable income last year was \$42,870. What was her total state and city income tax?

18. Helmut Schmidt pays a city income tax of $2\frac{1}{4}\%$ on his taxable income of \$28,834. In addition, he pays both state and federal income taxes on the same taxable income. If his federal tax last year was \$4,538, what was the total of his federal, state, and city income taxes last year?

INTEGRATING YOUR KNOWLEDGE Alma Ruforio is a medical technician. Last year, her employer withheld \$520 from her wages for state income tax. When she prepared her tax return, Alma showed gross incomeof \$32,400 less \$5,450 as a standard deduction and one exemption for herself.

19. What was Alma's taxable income?

20. What was her state tax for the year?

21. How much is her refund or tax due?

Photodisc/Getty Images

Mixed Review

22. $4\frac{2}{5} + 6\frac{1}{2}$ 23. $17\frac{1}{4} - 6\frac{1}{3}$ 24. $8\frac{1}{2} \times 5\frac{1}{3}$

25. Valerie Bassett is paid 5% commission on all sales up to and including \$25,000, and 7% on all sales over \$25,000 in any month. Last month Valerie's sales were \$45,250. What was the amount of her total commission?

26. Last year the Pavlos earned \$72,800 from salaries. They also earned \$1,280 in interest and \$2,789 in dividends. The Pavlos paid \$6,240 into a retirement fund. What was their adjusted gross income for the year?

2-4

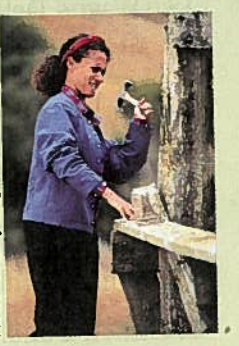
Benefits and Job Expenses

GOALS
- Find total job benefits
- Find net job benefits
- Compare the net job benefits of jobs

KEY TERMS
- employee benefit
- job expense
- net job benefit

Start Up ▶▶▶

Sally's uncle asked her to help with a remodeling job that will take 10 days to complete. He said he would pay Sally $60 a day or start with $1 for the first day and double her pay each day. Which wage do you think will earn Sally the most money?



Photodisc/Getty Images

Math Skill Builder

Review these math skills and solve the exercises that follow.

1. **Add** money amounts.
Find the sum. $43,112 + $3,078 + $1,087 + $466 = $47,743

1a. $19,208 + $189 + $2,417 + $25

1b. $78,297 + $35 + $108 + $3,108

2. **Subtract** money amounts.
Find the difference. $39,087 − $8,648 = $30,439

2a. $98,085 − $13,498

2b. $29,337 − $2,073

2c. $101,882 − $24,938

2d. $289,108 − $57,650

3. **Multiply** money amounts.
Find the product. $8.75 × 40 = $350

3a. $12.88 × 36

3b. $15.39 × 38

3c. $10.82 × 40

3d. $10.10 × 32

Business *Tip*

Health insurance is often too costly for many workers. Some companies provide health insurance at a lower cost as a benefit to their workers.

Total Job Benefits

In addition to wages, many employers provide other things of value called **employee benefits** or *fringe benefits.* For example, employers may provide low-cost health and accident insurance, life insurance, and pensions. They may also provide paid holidays, sick leave, and vacation time, the use of a car, a credit union, uniforms, parking, discounts for purchases of merchandise, recreational facilities, child care, and education or training.

Employee benefits are an important part of a job's total value. Benefits can be worth from 15% to 40% of the amount paid in wages. Benefits may be stated in money amounts or as a benefit rate, which is a percent of gross pay.

Total Employee Benefits = Benefit 1 + Benefit 2

Total Employee Benefits = Benefit Rate × Gross Pay

When you are considering a job offer, the value of employee benefits should be added to the amount of wages to find the *total job benefits.*

Total Job Benefits = Gross Pay + Employee Benefits

Calculator *Tip*

Add the benefits first to find the total benefits package. Then add the gross pay to the benefits package to get total job benefits.

EXAMPLE 1

Kirby Rosen is a manager with Durable Products, Inc. Last year Kirby earned gross pay of $34,800 and these benefits: paid pension, $2,784; health insurance, $1,892; paid vacation, $1,338; paid holidays, $2,007; and free parking, $425. What total job benefits did Kirby receive last year?

SOLUTION

Gross pay: $34,800

Benefits:	Paid pension	$2,784
	Paid vacation	$1,338
	Free parking	$425
	Health insurance	$1,892
	Paid holidays	$2,007
Total employee benefits:		$8,446

Total job benefits: $34,800 + $8,446 = $43,246

✔ CHECK YOUR UNDERSTANDING

A. Vi Schashack estimated her yearly fringe benefits last year to be: health insurance, $2,580; paid vacations and holidays, $3,133; paid pension, $2,545. Vi's gross pay was $31,807 last year.
(1) What were Vi's total employee benefits for last year?
(2) What were Vi's total job benefits for last year?

B. Lin Ping earned gross pay of $28,089 last year. Her yearly benefits are 33% of her gross pay.
(1) What were Lin's total fringe benefits for last year?
(2) What were her total job benefits for last year?

Net Job Benefits

Almost every job has expenses. Some examples of **job expenses** are union or professional dues, commuting expenses, uniforms, licenses, and tools. To find **net job benefits**, subtract total job expenses from total job benefits.

Net Job Benefits = Total Job Benefits − Job Expenses

EXAMPLE 2

Rita Espinosa had total job benefits of $32,620. Her job expenses were $1,624 for commuting, $135 for a required license, $275 for professional dues, and $75 for the company birthday fund. Find her net job benefits.

SOLUTION

Total job benefits: $32,620

Job expenses: Travel + License + Professional Dues + Birthday Fund
$1,624 + $135 + $275 + $75 = $2,109

Total expenses: $2,109

Net job benefits: $32,620 − $2,109 = $30,511

Photodisc/Getty Images

✔ CHECK YOUR UNDERSTANDING

C. Ben Asimov found that his job expenses for last year were: uniforms, $329; licenses, $278; professional dues, $475; commuting costs, $1,077. His total job benefits for the same period were $56,102. Find his net job benefits.

D. Nicki's total job benefits for the previous year were estimated to be $78,299. However, her job expenses for the same job were: licenses, $580; commuting costs, $1,793; technical books, $2,057. What were her net job benefits for the year?

Comparing Net Job Benefits

When you compare jobs you should consider many features about each job, not just the net job benefits offered by each job. For example, you should consider how much you like the job, the chances for raises and promotions, the chances of layoffs, and job security.

EXAMPLE 3

Iko Moro's job pays $33,750 in yearly wages and 26% of her wages in yearly benefits. She estimates that yearly job expenses are $2,354. Another job that she is looking at pays $32,590 in yearly wages and has estimated yearly benefits of 29%, with job expenses of $2,080. Which job offers the greater net job benefits, and how much greater?

SOLUTION

Rewrite Iko's estimated benefit percent as a decimal. Multiply her yearly wages by the decimal rate to get the benefits of the job.

Add the benefits and yearly wage amounts, and subtract the job expenses to find the net job benefits of the job.

Iko's current job	*The other job she is considering*
\$33,750 × 0.26 = \$8,775	\$32,590 × 0.29 = \$9,451.10
\$33,750 + \$8,775 − \$2,354 = \$40,171	\$32,590.00 + \$9,451.10 − \$2,080.00 = \$39,961.10

Subtract the net job benefits of the other job from the net job benefits of Iko's current job.

\$40,171.00 − \$39,961.10 = \$209.90

Iko's current job offers her the greatest net job benefits, by \$209.90.

✔ CHECK YOUR UNDERSTANDING

E. Ted Roberts earned a salary of \$41,700 last year. His benefits were 32.5% of his salary. His job expenses totaled \$3,180. Ted is looking at another job that offers \$45,260 in wages and 24% in benefits. His job expenses for the other job total \$3,740. Which job offers the greatest net job benefits, and how much greater?

F. Amy Weir had these job expenses last year: union dues, \$650; tools, \$1,890; uniforms, \$375; licenses, \$480. She earned \$49,500 in wages and received benefits worth 29% of her wages. She has been offered another job at another company that will pay \$45,200 in wages and 34% in benefits. Amy's job expenses for the other job are: commuting, \$2,560; licenses, \$480; tools, \$590; parking, \$380. Which job offers the greatest net job benefits, and how much greater?

Wrap Up ▶ ▶ ▶

Sally would receive \$600 (\$60 per day × 10 days) in the first offer. The second offer would pay her \$1,023. Isn't it amazing how quickly doubling your daily pay starting with only \$1 can add up?

Exercises

Find the sum.

1. \$1,034 + \$215 + \$65,901 + \$819

2. \$82,298 + \$3,725 + \$406 + \$616

Find the difference.

3. \$45,823 − \$41,637

4. \$35,789 − \$30,479

5. \$52,907 − \$48,278

6. \$156,980 − \$75,345

Rewrite percents as decimals.

7. 56.4%

8. 3.8%

9. 23.6%

10. 13.723%

Find the product.

11. \$44,098 × 25.7%

12. \$52,491 × 31.8%

13. \$29,926 × 23.245%

14. \$31,044 × 15.5%

John Bellows earned gross pay of $26,888 last year. He estimates his yearly benefits to be: paid pension, $1,828; health and life insurance, $1,654; paid vacations and holidays, $2,582; free parking, $237.

15. What were John's total estimated benefits for last year?

16. What were his total job benefits for last year?

17. Thomasina Serling had the following job expenses for last year: union dues, $529; licenses, $178; commuting costs, $2,709. Her total job benefits for the same period were $46,192. Find her net job benefits.

BEST BUY Jorge Conseco can work for ABM, Inc. for $437 per week or Zeda, Inc. for $1,408 per month. Benefits average 19% of yearly wages at ABM and 25% at Zeda. Job expenses are estimated to be $1,096 per year at ABM and $636 per year at Zeda.

18. Which job would give Jorge more net job benefits for a year?

19. How much more?

20. **CRITICAL THINKING** The value of some benefits, such as paid holidays, can be figured very accurately. However, the value of other benefits, such as free recreation facilities, can only be estimated. If you were offered a benefit package that included use of a free gymnasium, how would you estimate its dollar value?

INTEGRATING YOUR KNOWLEDGE Nora Bertram works at Radnor Products, Inc. and is paid a salary of $25,000 plus 5% commission on all her sales. Last year her sales were $200,000. Nora's benefits were: paid pension, $3,150; health insurance, $2,400; paid vacations and holidays, $3,365. Her job expenses are $3,007. She is considering a job offer from B-Tree, Inc. that pays a salary of $30,000 plus 6% commission on all sales over $100,000. She estimates her benefits at B-Tree to be $8,489 and her job expenses to be $2,050.


Photodisc/Getty Images

21. If Nora's sales at B-Tree were $200,000, which job would give her more net job benefits?

22. Use your answer from Exercise 22 to determine how much more the net job benefits would be.

Mixed Review

Change to decimals.

23. $\frac{3}{8}$ 24. 87.6% 25. 0.5% 26. $\frac{1}{4}$%

Change to fractions or mixed numbers and simplify.

27. 25% 28. 250% 29. 10%

30. Cromwell, Inc. employs 5 people at a branch office. Their weekly wages are: Fred, $423.34; Erin, $479.14; Bob, $378.98; Susan, $528.20; and James, $462.93. What is the average weekly wage at the branch office?

2-5

Analyze Take-Home Pay

GOALS

- Calculate take-home pay as a percentage of gross pay
- Calculate the impact of a raise on take-home pay
- Calculate potential tax savings of a cafeteria plan

KEY TERM

- cafeteria plan

Start Up

Raul has been working for the same employer for a year. He was given a $75 per month increase to his gross monthly wages. He has been planning how to use an extra $75 per month. What advice would you give Raul?

Image Source/Jupiter Images

Math Skill Builder

Review these math skills, and answer the questions that follow.

Math *Tip*

To rewrite a decimal as a percent, move the decimal point two places to the right and add a percent sign.

To rewrite a percent as a decimal, move the decimal point two places to the left and drop the percent sign.

1. **Add** money amounts.
Find the sum. $22.85 + $63.22 + $43.18 = $129.25

1a. $23.18 + $14.86 + $55.18

1b. $99.20 + $3.47 + $18.63

2. **Subtract** money amounts.
Find the difference. $675.00 − $83.27 = $591.73

2a. $2,456.00 − $843.67

2b. $458.22 − $86.13

2c. $325.46 − $65.98

3. **Calculate** the percent and round to the nearest percent.
What percent of 160 is 120? 120 ÷ 160 = 0.75 = 75%

3a. What percent of 550 is 485?

3b. 18 is what percent of 45?

3c. What percent of 15 is 12?

3d. 45 is what percent of 60?

4. **Multiply** money amounts by percents, and round the product to the nearest whole cent.
Find the product. $427.25 × 6% = $427.25 × 0.06 = $25.635 or $25.64

4a. $2,842.00 × 3%

4b. $388.49 × 6.5%

4c. $759.32 × 7%

4d. $1,764 × 1.5%

Take-Home Pay as a Percentage of Gross Pay

Clearly, there is a difference between gross pay and take-home pay. Taxes, insurance, and other deductions reduce the part of your income that you actually take home. One way to judge the impact that deductions have on your pay is to calculate the percentage of gross pay that you take home.

EXAMPLE 1

Rosalinda's monthly gross pay is $3,000. Out of those wages, $304 in federal withholding, $229.50 in FICA taxes, $60 in state income taxes, and $175 in health insurance premiums were deducted. Find the percentage of gross pay that Rosalinda takes home to the nearest percent.

SOLUTION

Find Rosalinda's take-home pay.

$304 + $229.50 + $60 + $175 = $768.50 Add to get total deductions.

$3,000 − $768.50 = $2,231.50 Subtract the total deductions from gross pay.

$2,231.50 ÷ $3,000 = 0.74 = 74% Calculate percent.

Rosalinda's take-home pay is 74% of her gross pay.

✔ CHECK YOUR UNDERSTANDING

A. Ross earns $500 per week. Each week, $38 is deducted for federal income taxes, $38.25 is deducted for FICA taxes, $30 is deducted for state taxes, $84 is deducted for health insurance, and $2.50 is deducted for union dues. Find the percentage of his gross wages that Ross takes home to the nearest percent.

B. Lisa Dewees earns $15.00 per hour, and she works 40 hours per week. The deductions from her weekly pay include $76 in federal income taxes and $45.90 in FICA taxes. To the nearest percent, find the percentage of her gross wages that Lisa takes home.

Evaluating the Impact of a Raise

Employers may offer employees a raise in pay if they have worked for the employer for a length of time or if they are good workers. In addition, employees can receive a promotion that gives them greater responsibilities and also a raise in pay.

Raises might be expressed as an increase in a dollar amount per hour, per pay period or an increase per year. Other raises may be expressed as a percentage of the current gross pay.

When you are paid a raise, that raise impacts your deductions. Because taxes are a percent of your gross pay, as your income increases, the amount of money you pay in taxes increases.

EXAMPLE 2

Susan earns $450 a week at her job. She is given a 5% raise. She is a single taxpayer who claims one withholding allowance. Federal, FICA, and a 5% state income tax are withheld from her wages. What is the increase in her gross wages? How much does her net pay increase per week with her raise? (Use the withholding table on pp. 41 and 42)

SOLUTION

$450 × 0.05 = $22.50 Find the increase in gross wages.

$450 + $22.50 = $472.50 Add increase to wages.

	Current	With Raise
Gross wages	$450.00	$472.50
Federal income tax	$ 43.00	$ 46.00
FICA	$ 34.43	$ 36.15
State income tax	$ 22.50	$ 23.63
Total deductions	$ 99.93	$105.78
Take-home pay	$450.00	$472.50
	−$ 99.93	−$105.78
	$350.07	$366.72

$366.72 − $350.07 = $16.65

Susan's gross wages increase $22.50 per week. Her net pay increases $16.65.

✔ CHECK YOUR UNDERSTANDING

C. Alejandra makes $500 per week. She is given a 4% raise. She is a single taxpayer who claims zero withholding allowances. Federal income, FICA, and a 3% state income tax are deducted from her pay. What is the increase in her gross wages? How much will her net pay increase?

D. John Daniels earns $11.00 an hour and works 40 hours per week. He is offered a promotion and an 8% raise. He is a married taxpayer who claims 3 withholding allowances. Federal income and FICA taxes are deducted from his wages. How much will his gross wages increase? How much will his net pay increase?

Pre-Tax Deductions

Some employers offer employees the opportunity to participate in a Section 125 plan. Sections 125 plans are nicknamed **cafeteria plans** because they offer a wide variety of options from which employees can choose, much like choosing food in a cafeteria line.

In a cafeteria plan, the employee directs the employer to deduct a certain amount of money from wages before taxes. This money is put into an account that is used to pay for qualified expenses, such as health or life insurance premiums, child care, or healthcare expenses.

By taking the cafeteria plan deductions before taxes, it reduces the amount of wages subject to taxes, thereby reducing the amount paid in taxes.

Consumer Alert

A Section 125, or cafeteria plan, can be a good way to reduce your taxes.

However, before participating in a cafeteria plan, workers need to read and understand the terms of the plan, such as which expenses qualify for the plan and how to account for those expenses.

Participants need to understand that under current law, money that is put into a cafeteria plan account must be used for qualified expenses by the end of the calendar year or it is lost. Cafeteria plans are governed by the U.S. Tax Code, and are subject to change.

EXAMPLE 3

Jacob earns $525 a week. He is a married taxpayer who claims two withholding allowances. From his wages, the following amounts are withheld: $65 in health insurance, federal taxes, FICA tax, and a 5% state income tax. If he participates in his employer's cafeteria plan and has the $65 per week for health insurance deducted from his wages before taxes, how much will it reduce his taxes? (Use the withholding table on pp. 41 and 42)

SOLUTION

	Current	With cafeteria plan
Gross wages	$525.00	$525.00
Cafeteria plan		$ 65.00
Taxable income	$525.00	$460.00
Federal income tax	$ 24.00	$ 18.00
FICA	$ 40.16	$ 35.19
State income tax	$ 26.25	$ 23.00
Total taxes	$ 90.41	$ 76.19

$90.41 − $76.19 = $14.22.

Jacob will pay $14.22 less in taxes per week if his health insurance is deducted before taxes.

✔ CHECK YOUR UNDERSTANDING

E. Tonja is a married taxpayer who claims 2 withholding allowances. She earns $600 per week, and pays $150 per week in childcare expenses. How much will she save in federal income and FICA taxes if she has her childcare expenses deducted from her check before taxes?

F. Enrique makes $11.50 per hour and works 40 hours per week. He is single and claims 0 withholding allowances. He estimates that he will spend $100 per month on qualified expenses. How much will he save per week in taxes if he participates in his employer's cafeteria plan and has $100 per month deducted before taxes? How much will he save in one year, or 50 weeks of work?

Employers benefit from cafeteria plans as well. Because employers are required to pay taxes on each employee's taxable income also, the amount of tax due for an employee that participates in a cafeteria plan is reduced. In addition, by offering cafeteria plans that reduce the amount of taxes employees pay, employers effectively give employees a "raise" without spending more money on wages.

Wrap Up

Although Raul is getting a $75 raise, he will not have an extra $75 per month to spend. Federal, FICA, and possibly state and local income taxes will reduce his raise. Before planning what to do with the extra money, Raul should wait and see how much his take-home pay actually increases.

TEAM Meeting

Form a team with two other students. Each team member should interview one person who receives a paycheck. Each team member should prepare a three-column report of the interview. Make the first column show required deductions; the second, personal or optional deductions; the third, percent of paycheck. Compare lists. Then combine the lists into one, three-column report. When deductions from two or more lists match, show the percents of paycheck as a range of percents using the lowest and highest percents found for that deduction.

PhotoAlto/Getty Images

Exercises

Find the sum.

1. $26 + $18.23 + $6.07 + $14.10
2. $62 + $75.31 + $24.84 + $10.21

Find the difference.

3. $643.81 − $86.22
4. $2,876.42 − $186.40
5. $1,543.28 − $127.33
6. $342.91 − $111.31

Calculate the percent, to the nearest tenth.

7. 63 is what percent of 75?
8. 156 is what percent of 280?
9. What percent of 600 is 120?
10. What percent of 1,500 is 1,226?

Find the product.

11. $629 × 5%

12. $761 × 6.45%

Yolinda earns $4,000 per month. The following amounts are deducted from her gross wages: $584 federal income taxes, $248 Social Security, $58 Medicare, $120 state income taxes, and $120 health insurance.

13. Find the total deductions from Yolinda's check.

14. What is Yolinda's monthly take-home pay?

15. To the nearest percent, what percent of her gross pay does Yolinda take home?

16. Yolinda is offered a 6.5% raise. How much will her gross pay increase each month?

17. With her raise, Yolinda's deductions increase to $1,217.69. What is her new take-home pay?

18. How much did Yolinda's take-home pay increase?

19. After her raise, what percent of her gross pay does Yolinda take home?

Complete the table below for the weekly wages of each employee. Round to the nearest whole percent. Use the withholding tables on pp. 41 and 42.

	Name	Allow-ances	Marital Status	Gross Wages	Income Tax	FICA (7.65%)	Other	Net Wages	% Gross Pay
20.	Jason	1	Single	$463.95			$65.17		
21.	Conn	0	Single	$395.22			$22.80		
22.	Flora	3	Married	$571.14			$73.16		
23.	Marta	6	Married	$452.35			$85.46		
24.	Elena	2	Married	$536.72			$55.21		

John Stone is married with 3 withholding allowances. Each week his employer deducts federal withholding taxes, Social Security taxes, Medicare taxes, and $58.12 for health insurance from his gross pay. His gross weekly wage is $578. His employer gives him a 6% raise.

25. How much will John's gross pay increase?

26. What is John's net pay before his raise?

27. What is John's net pay after his raise?

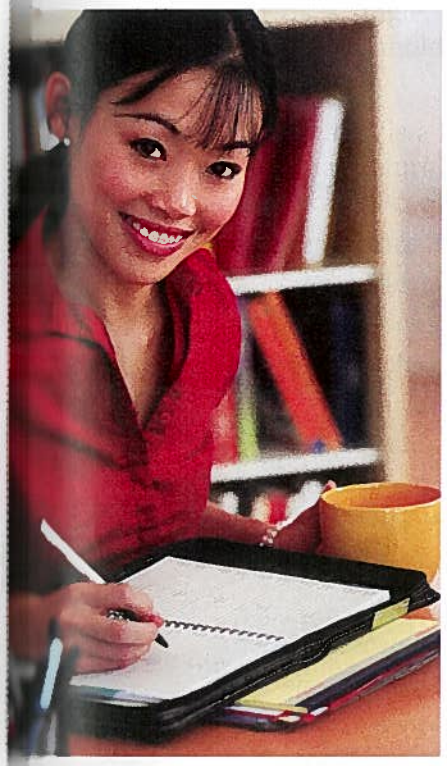
28. How much did John's net pay increase with his raise?

Sarah Cutler is paid a weekly salary of $525. She is married and claims 3 withholding allowances. Federal withholding taxes, FICA, and a 2% state income tax are deducted from her gross pay. She also has childcare expenses of $75 per week.

29. What amount is deducted each week for taxes?

30. If she had her childcare expenses deducted from her check before taxes, how much would be deducted each week for taxes?

31. How much would she save per week in taxes? How much would she save in a year, or 52 weeks?



Blend Images/Jupiter Images

Raku Tung is a single taxpayer who claims 1 withholding allowance. She makes $485 per week and has federal withholding taxes, FICA taxes, and $43 for health insurance deducted from her check each week. She is planning to get married and will change her withholding allowances to 2. Round any percents to the nearest whole percent.

32. What is her net pay before she gets married?

33. What percent of her gross pay does she take home?

34. What is her net pay after she gets married?

35. What percent of her gross pay will she take home after she gets married?

36. What will her net pay be if she participates in her employer's cafeteria plan and has her health insurance cost deducted before taxes after she is married?

37. What percent of her gross pay will she take home if she participates in the cafeteria plan?

38. **CRITICAL THINKING** Explain why you may take home a lower percentage of your gross pay after you get a raise.

Mixed Review

39. 7.7% of $23,500

40. $35,290 − $1,549

41. $3\frac{1}{8} + 14\frac{2}{3}$

Calli Burns was paid $14.56 an hour for 37.5 hours last week.

42. What was Calli's gross pay for the week?

43. How much was deducted for Social Security taxes at 6.2%?

44. Olaf Svenson worked 8 hours on Monday and Tuesday, 9 hours on Wednesday, and 10 hours on Thursday and Friday. Olaf is paid $12 an hour and time-and-a-half for time past 40 hours in a week. What was Olaf's gross pay for the week?

45. The Carter's taxable income last year was $43,780. They paid a state tax of 3.6% and a city tax of 1.35% on that income. What was the total of the state and city taxes they paid?

46. Terry Jansen works on a piece-rate basis. He completed 70 pieces on Monday, 68 on Tuesday, 74 on Wednesday, and 72 on Thursday. He is paid $1.20 for each piece. How many pieces must he complete on Friday so that his earnings for the 5 days will average $84 a day?

47. Yancy works for $14.35 an hour and gets paid time-and-a-half for overtime hours and double time for weekend hours. This week Yancy worked 40 regular hours and 11 overtime hours. Last week, Yancy worked 35 regular hours and 11 weekend hours. Which week did he earn more in wages and by how much?

Chapter Review

Vocabulary Review

Find the term, from the list at the right, that completes each sentence. Use each term only once.

1. An amount subtracted from gross pay is a(n) __?__.
2. Total income in a year that includes income from wages, salaries, commissions, bonuses, tips, interest, dividends, prizes, pensions, the sale of stock and profit from a business is called __?__.
3. Adjusted gross income less deductions and exemptions is __?__.
4. A tax in which the rate does not vary with the amount of income is (a, an) __?__.
5. Gross pay less deductions is __?__.
6. Things of value provided by employers in addition to wages are __?__.
7. The amount left after subtracting adjustments to income from gross income is __?__.
8. An amount of income per person that is free from tax is called a(n) __?__.

adjusted gross income
cafeteria plan
deduction
employee benefits
exemption
flat tax
gross income
job expense
net job benefit
net pay
standard deduction
taxable income
withholding allowance
withholding tax

2-1 Deductions from Gross Pay

9. Christy Bellows is a married worker earning $612.83 each week. She claims 3 withholding allowances. What amount should be deducted from her weekly earnings for federal withholding taxes?
10. Ron Adams earns $450 in gross wages on January 10. How much is deducted from Ron's gross wages for Social Security at 6.2% and Medicare at 1.45%?
11. Luisa Medina is paid $556 a week. Her employer deducts $56 for federal withholding tax, $54.78 for insurance, 6.2% for Social Security taxes, and 1.45% for Medicare taxes. For the week, what are her Social Security and Medicare taxes, total deductions, and net pay?

2-2 Federal Income Taxes

12. Freida Werner earned gross income of $45,600 last year. She made payments into an approved retirement plan of $3,600. What was her adjusted gross income last year?
13. Jorge Viscano had $38,000 in adjusted gross income last year. He took the standard deduction of $5,450 and one exemption for himself for $3,500. What was his taxable income for the year?

14. Ben Uris is single, has taxable income of $23,500, and his employer deducted $3,640 in withholding taxes. Find Ben's tax due and any refund or amount owed.

15. Elena Alvarez is a high school student and her parents claim her as a dependent on their tax return. Elena works part-time and earned $2,490 last year. Her employer deducted $320 in withholding taxes. Elena also earned $320 in interest on a savings account and had no adjustments to income. Elena wants to file for a refund and claim the standard deduction instead of itemizing deductions. What is the amount of Elena's refund?

2-3 State and City Income Taxes

16. Alan Grey has federal taxable income of $31,500. He pays a state income tax rate of 3.5% on his federal taxable income. Find his state income tax.

17. Haru Umeki's taxable income is $44,200. Find her state income tax if she pays $1,600 plus 7% of her taxable income over $40,000.

2-4 Benefits and Job Expenses

18. Juan Romero earns a gross pay of $44,500. His employee benefits are 18% of his gross pay. What are his total job benefits?

19. Shirley Evans earns $20.50 per hour, working 40 hours a week, 50 weeks a year. Her employee benefits include $1,200 per year for health insurance and $500 per year for free parking. Her expenses include $325 for dues and $1,300 for commuting. What are Shirley's net job benefits?

20. Phyllis Regan's job pays $46,350 plus 24% of wages in benefits. She estimates that her yearly job expenses are $2,256. A job she has been offered pays $49,750 with these estimated benefits: $3,980 in pensions, $450 in free parking, $1,080 in paid vacation, $1,560 in paid holidays, $2,100 in health insurance, and $400 in tools. The job has job expenses of $2,624. Which job offers the greater net job benefits? How much greater?

21. Ursala Thomas had the following job expenses for last year: union dues, $388; licenses, $109; commuting costs, $1,478. Her total job benefits for the same period were $39,256. Find her net job benefits.

2-5 Analyze Take-Home Pay

22. Joe Palucci earns $2,500 per month. Out of those wages, $266 in federal income taxes, $191.25 in FICA taxes, $100 in state income taxes, and $125 in health insurance premiums were deducted. Find the percentage of gross pay that Joe takes home, to the nearest percent.

23. Maggie Ryan earns $350 a week at her job. She is given a 7% raise. She is a single taxpayer who claims one withholding allowance. Federal, FICA, and a 4% state income tax are withheld from her wages. What is the increase in her gross wages? How much does her net pay increase per week with her raise?

24. Joe Marlow's weekly wages are $585. He has federal withholding, FICA, and $125 for health insurance deducted from his check. He is married and claims 2 withholding allowances. How much will he save in taxes if he has his health insurance deducted before taxes?

Technology Workshop

Task 1 Enter Data in a Payroll Sheet Template

Complete a template that calculates the Social Security tax, Medicare tax, and net pay for each employee of the Bainbridge Company.
Open the spreadsheet for Chapter 2 (tech2-1) and enter the data shown in blue (cells E6-F15). Social Security taxes, Medicare taxes, and net pay are calculated for each employee. Your finished spreadsheet should look like the one shown.

	A	B	C	D	E	F	G	H	I	J	K
1	Bainbridge Company										
2	Payroll Sheet for January 15, 20—										
3	Employee No.	Name	Allow-ances	Mar-ried	Gross Wages	Deductions					
4						Income Tax	Social Security	Medicare	Other	Total Deductions	Net Pay
5											
6	1	Ajanaku	1	N	421.02	39.00	26.10	6.10	35.45	106.65	314.37
7	2	Bell	1	N	435.89	40.00	27.03	6.32	37.84	111.19	324.70
8	3	Cole	0	Y	502.54	38.00	31.16	7.29	49.75	126.20	376.34
9	4	Dern	1	N	399.50	34.00	24.77	5.79	31.54	96.10	303.40
10	5	Evers	2	Y	575.64	29.00	35.69	8.35	58.97	132.01	443.63
11	6	Ford	5	Y	449.54	0.00	27.87	6.52	50.02	84.41	365.13
12	7	Gomez	0	Y	557.76	45.00	34.58	8.09	57.64	145.31	412.45
13	8	Huang	2	Y	450.89	17.00	27.96	6.54	38.19	89.69	361.20
14	9	Isom	0	N	438.27	50.00	27.17	6.35	37.17	120.69	317.58
15	10	Jackson	3	Y	580.24	23.00	35.97	8.41	61.55	128.93	451.31
16		Totals			4,811.29	315.00	298.30	69.76	458.12	1,141.18	3,670.11
17											
18	Social Security Rate 0.062										
19	Medicare Rate 0.0145										

Task 2 Analyze the Spreadsheet Output

Answer these questions about your completed payroll sheet.

1. Which employee had the largest net pay for the period?
2. Which employee had the largest amount of deductions?
3. Which employee had the greatest number of allowances?
4. Which employees paid more in combined Social Security taxes and Medicare taxes than they paid in income taxes?
5. What was the total amount of income taxes withheld from wages for the week?

Now move the cursor to cell E18, labeled Social Security. Enter the rate 0.065.

Notice how the Social Security tax, total deductions, and net pay amounts all change. These changes show what would happen if the Social Security tax rate was updated from 6.2% to the higher 6.5%.

Answer these questions about your updated payroll sheet.

6. What is the formula used in cell F16? What arithmetic is done in the cell?
7. What is the formula used in cell G6? What arithmetic is done in the cell?
8. What is the formula used in cell H6? What arithmetic is done in the cell?
9. What is the formula used in cell J13? What arithmetic is done in the cell?
10. Why did changing cell E18 change the amounts throughout the rest of the spreadsheet?

Task 3 Design a Job Benefits Spreadsheet

Design a spreadsheet that will allow you to compare net job benefits.
The spreadsheet for Task 1 includes formulas that use subtraction, multiplication, and the SUM function. Create a spreadsheet that will use these same types of formulas for the situation below. The spreadsheet should allow you to compare the jobs based on net benefits. Assume that each job is for a 40-hour week and 52-week year. Your spreadsheet should contain a row for each of the items shown. In addition, you should enter row or column labels and formulas to calculate annual gross pay, pension benefits, total job benefits, total job expenses, and net job benefits.

DATA: You receive two job offers. The expenses and benefits for each job are shown at the right.

	Offer 1	Offer 2
Salary Information		
Hourly Rate	$11.25	$12.05
Annual Benefits		
Health Insurance	$2,500	--
Life Insurance	$250	$325
Health Club Membership	--	$550
Pension*	8%	6%
Free Parking	$650	--
Expense Information		
Commuting Costs	$777	$955
Dues	$98	$150
Tools	--	$380
Uniforms	--	$425

*Stated as a percent of annual salary.

Task 4 Analyze the Spreadsheet Output

Answer these questions about your completed spreadsheet.

11. How did you calculate annual pension benefits?
12. What were the net job benefits of Offer 1? Offer 2?
13. Which job offered the highest total employee benefits? How much higher?
14. Which job benefits package do you think is better?
15. If you were to:
    (a) change the pension percentage rate for Job 1 to 7%,
    (b) change the hourly rate to $12.50 for Job 1, and
    (c) eliminate life insurance as a benefit from both jobs,

    what is the difference in net benefits between the two offers?

Chapter Assessment

Chapter Test

Answer each question.

1. Write $\frac{17}{100}$ as a decimal.
2. Rewrite 0.24 as a fraction in lowest terms.
3. \$68 is what percent less than \$80?
4. Subtract: \$34,510.23 − \$7,388.04
5. Multiply: 3.85% × \$45,076
6. Divide: \$563 ÷ 0.1
7. \$36 is what percent greater than \$20?
8. $\frac{1}{6}$ less than \$360 is what number?
9. Add: \$506.45 + \$108.45 + \$78.31 + \$1,957.23
10. Rewrite 0.05879 as a percent to the nearest tenth of a percent.

Solve.

11. Phan Am Van earned gross wages of \$487.12. Phan's deductions were: \$48 in federal withholding taxes, 6.2% in Social Security taxes, 1.45% in Medicare taxes, \$28.74 in health insurance, and \$12 in union dues. Find the total deductions from Phan's gross pay.
12. Find Phan's net pay.
13. A job you are considering offers these benefits: paid vacations, \$2,230; paid holidays, \$2,450; paid pension, \$4,058.60; paid health insurance, \$428.90. What are the total employee benefits of the job?
14. Sally Longfeather earns an annual wage of \$43,589. She estimates job benefits at 31.5% of her wages and her job expenses at: insurance, 4% of her wages; transportation, \$1,296; dues, \$200; and birthday fund, \$50. What are her annual net job benefits?
15. A married couple earned a total of \$86,340 last year. Their taxable income is \$70,000. Their state uses a graduated income tax. They owe \$3,520 plus 10% of their taxable income over \$64,000. How much do they owe in state income taxes?
16. Evelyn Johnson had gross income of \$33,200. She also had adjustments to income of \$2,700, itemized deductions of \$5,600, and 2 exemptions at \$3,500. What was Evelyn's taxable income?
17. Tim O'Leary had a taxable income of \$19,600 last year. His employer withheld taxable income, what amount should Tim receive as a refund?
18. Vance Milo had an earned income of \$2,250 last year from part-time work. He also earned \$24.15 in interest from a savings account. His father claimed him as an exemption on his tax return. If Vance's employer withheld \$280 from his wages for withholding taxes, how much should Vance get back as a refund on his federal income taxes?
19. Sonia Ruiz earns \$485 per week. The following deductions are taken from her gross pay: \$58 federal withholding, \$37.10 FICA, \$14.55 state income taxes, and \$35.00 health insurance. To the nearest percent, what percent of her gross pay does Sonia take home?
20. Genaro Torres makes \$400 per week. He receives a 2% raise. He is single and claims zero withholding allowances. Federal income taxes and FICA are withheld from his gross pay. How much does his gross pay increase with his raise? How much does his net pay increase?

Planning a Career in Human Services


David Gilder 2008/Shutterstock.com

There are a wide variety of career choices available in human services. Workers in human services help others to improve their quality of life by providing support, services, or information. Opportunities exist in social work, geriatrics, counseling, nonprofit organizations, and community work. Workers in human services can be found in employment services, nursing homes, governmental social services, hospitals, and charities. If you are patient, optimistic, and enjoy helping people, a career in human services may be a rewarding career pathway for you.

Job Titles

- Social worker
- Case manager
- Gerontology assistant
- Community outreach worker
- Career counselor
- Mental health aide
- Occupation therapist
- counselor
- Human Resources manager

Needed Skills

- excellent communication skills with both clients and coworkers
- strong assessment skills
- outstanding human relation skills
- ability to create or follow treatment plans
- outstanding leadership skills
- ability to work independently, as well as with others

What's it like to work in Social Work?

Social workers assess client need and eligibility, arrange for benefits, and monitor and record client progress. They may work with other professionals like psychiatrists or physical therapists to assist in making and following a client treatment plan to advance life or job skills, improve physical performance, and live more effectively with others. Some social workers are case managers for family services. These case managers work with families in crisis. Families are monitored to ensure participation in treatment plans that bring improvement. These case managers often report their assessments and observations directly to the judicial system for court-ordered treatment plans. Some social workers have a great deal of responsibility and work with little supervision.

What About You?

Can you see yourself working in the field of human services? Which job is most appealing to you?

How Times Have Changed

For Questions 1–2, refer to the timeline on page 39 as needed.

1. In 1990, the government collected $336.3 billion in Social Security and Medicare taxes. In 2000, the government collected $593.3 billion in Social Security and Medicare taxes. If the tax rate was 7.65% for both years, what would account for the increase in collections?
2. If you earn a salary of $35,000, how much more would you pay in Social Security and Medicare taxes at the current rate, versus the previous rate?

Chapters 1–2 Cumulative Review

MULTIPLE CHOICE

Select the best choice for each question.

1. Last week Sarah Carver worked 4 overtime hours at time-and-a-half pay. Her regular pay rate is $8.70 per hour. What was her overtime pay for the week?

   A. $13.05 **B.** $52.20 **C.** $52.50
   D. $69.60 **E.** $400.20

2. Last year Jose Inez's gross income was $24,685. She had adjustments to income of $3,640. What was Jose's adjusted gross income last year?

   A. $21,045 **B.** $22,185 **C.** $25,825
   D. $28,325 **E.** $30,825

3. Carmen Rielly is paid piece-rate for each of the 268 items she produces in a week and she receives gross wages of $469. What is Carmen's per piece rate?

   A. $1.50 **B.** $1.70 **C.** $1.74
   D. $1.75 **E.** $2.75

4. Gary Kersting has taxable income of $34,672. He pays a city income tax of 1.5% on taxable income. What is Gary's city tax?

   A. $346.72 **B.** $490.83 **C.** $520.08
   D. $5,200.80 **E.** $34,151.92

5. Maureen Ritter is paid $275 a week and a commission of 7% on all sales. Her sales last week were $3,904. What were her total earnings for the week?

   A. $273.28 **B.** $548.28 **C.** $558.28
   D. $2,732.80 **E.** $3,007.80

6. Jan Morrison's annual salary is $30,605. What is Jan's Social Security tax?

   A. $1,897.51 **B.** $1,989.32 **C.** $4,340
   D. $18,975.10 **E.** $28,707.49

7. Jontay Mays works 8 hours a day Monday through Friday. What is his gross pay for one week if he earns $9.84 per hour?

   A. $78.72 **B.** $314.88 **C.** $344.40
   D. $383.60 **E.** $393.60

8. Morgan Born is paid $11.20 an hour for a 40-hour week. Her estimated benefits are 33% of her wages. What is the value of her total yearly employee benefits?

   A. $165.76 **B.** $595.84 **C.** $1,989.12
   D. $7,687.68 **E.** $7,956.48

9. Dean Stroble is married and claims 2 withholding allowances. His gross weekly wage is $448. His withholding is $16 and FICA is $34.27. What is his net pay?

   A. $397.73 **B.** $431 **C.** $389.22
   D. $499.27 **E.** $465

10. Kim Lui is paid an annual salary of $28,680. She is paid every other week. What is her gross pay for each pay period?

A. $551.54 **B.** $1,103.08 **C.** $1,195
D. $1,434 **E.** $2,390

OPEN ENDED

11. Last week Jason Fields worked: Monday, 7.2 hours; Tuesday, 8.3 hours; Wednesday, 8 hours; Thursday, 8 hours; Friday, 7.4 hours. He is paid $8.90 per hour. What was Jason's gross pay last week?

12. LaDonna Ekwilugo had sales last month of $86,400. Her total earnings for the month were $5,156, which included $1,700 for her monthly salary. What rate of commission was LaDonna paid?

13. A shipping department has five workers: a supervisor who is paid $484 a week, and four other workers who are paid $390, $410, $425, and $430 a week. What is the average weekly pay for shipping department workers?

14. Janice Barton is an assembler in a factory and is paid $1.25 for each hand-held radio she assembles. During one week, Janice assembled these radio: 65 on Monday, 72 on Tuesday, 70 on Wednesday, and 68 on Thursday. How many radios must Janice assemble on Friday to earn $425 for the week?

QUANTITATIVE COMPARISON

Compare the quantity in Column A with the quantity in Column B. Select the letter of the correct answer from these choices:

A if the quantity in Column A is greater;
B if the quantity in Column B is greater;
C if the two quantities are equal;
D if the relationship between the two quantities cannot be determined from the given information.

15. Chris Beltsos is paid a salary of $280 a week and a commission of 5.5% on all sales. His sales last week were $5,025.

16. Alvin Barr's taxable income last year was $25,800. Jamaal White's taxable income last year was $29,600. Their state income tax rates were 5% for Alvin and 4% for Jamal.

17. Krista Egan worked 4 overtime hours at time-and-a-half pay. Her regular hourly rate is $9.85. Haley Kale worked 2.5 overtime hours at double-time pay. Her regular hourly rate is $11.82 per hour.

Column A	Column B
Chris' weekly salary	Chris' commission last week
Alvin's state income tax	Jamaal's state income tax
Krista's overtime pay	Haley's overtime pay

CONSTRUCTED RESPONSE

18. A friend has just graduated from high school and is looking at two job offers. One pays $12.50 an hour for a 40-hour week. The other pays $14 an hour for a 40-hour week. The friend thinks the choice is a no-brainer. The $14 an hour job pays more and so he should take that job. Write a letter to your friend to explain what other job factors should be examined before making the decision.

Chapter 3

Banking

Statistical Insights

Leading U.S. Commercial Banks		
Bank	**Headquarters**	**Consolidated Assets (Millions of Dollars)**
JP Morgan Chase Bank	Columbus, OH	1,318,888
Bank of America	Charlotte, NC	1,312,794
Citibank	Las Vegas, NV	1,251,715
Wells Fargo Bank	Sioux Falls, SD	467,861
US Bank	Cincinnati, OH	232,760
HSBC Bank	Wilmington, DE	184,492

Source: FederalReserve.gov

The Federal Reserve System was established in 1913 to serve as the central banking authority of the United States. Among its many responsibilities is to supervise commercial banks and protect consumer credit rights. The banks of the Federal Reserve make loans to commercial banks that make their profits by offering loans to businesses, industries, and individuals.

1. Write the assets of JP Morgan Chase Bank in standard form.
2. Which bank on the list has the least assets?
3. What is the dollar amount difference between the banks with the greatest and least assets?
4. Which two banks have less than a $20,000,000,000 difference in their consolidated assets?
5. **Explain** why a graph or table might use labels such as "Millions of Dollars" or "Amounts in Millions."

How Times Have Changed

When ATMs were first introduced, each machine was installed at a single bank location and customers could only access their accounts at that location. Today, customers can use ATMs all around the world to access their funds.

1960 — **1960** The bankograph, which allows customers to pay utilities without a teller, is installed in New York's First National Bank.

1965 — **1967** The first cash dispenser is installed in Barclay's Bank outside London.

1969 The first magnetically encoded plastic cards are used at an ATM.

1970 — **1971** The Docutel Corporation introduces the Total Teller, the first bank ATM.

1973 There are 2,000 ATMs in the U.S.

1974 ATMs are connected to each other by an online network.

1975

Research to find a significant event in 1978 that protects ATM consumers.

1980 — **1980** Banks begin charging ATM fees for customers who use another owner's ATMs.

1985

1990 — **1990** There are 80,156 ATMs in the U.S.

1995

2000

2004 There are 370,000 ATMs in the U.S.

2005 — **2007** The number of ATMs in the U.S. drops for the first time. (360,659).

NET Bookmark

The Federal Citizen Information Center web site provides information about how to protect consumers. Access www.cengage.com/school/business/businessmath and click Chapter 3. What three subcategories does the FCIC offer consumers on the topic of money?

EXAMPLE 2


Image Source/Jupiter Images

On January 1, Peter Monroe made an ATM deposit of $800 in a savings account that pays 2% interest, compounded quarterly. He made no other deposits or withdrawals. If interest is calculated and paid on April 1 and July 1, find the account balance (compound amount) and the compound interest on July 1.

SOLUTION

$I = \$800 \times 0.02 \times \frac{1}{4} = \$4$ interest for first quarter

Find the new account balance.

$\$800 + \$4 = \$804$ new balance, or new principal, on April 1

$I = \$804 \times 0.02 \times \frac{1}{4} = \$4.02$ interest for second quarter

Find the new account balance.

$\$804 + \$4.02 = \$808.02$ new balance on July 1

Find the difference between the July 1 balance and the original principal.

$\$808.02 - \$800 = \$8.02$ compound interest for two interest periods

The account balance (compound amount) on July 1 was $808.02. The compound interest for the two quarters is $8.02.

✔ CHECK YOUR UNDERSTANDING

C. Your bank pays 3% interest compounded quarterly on October 1 and January 1. You had $700 on deposit on July 1 and made no additional deposits or withdrawals. Find the account balance on January 1.

D. You deposited $400 on July 1 and kept your money on deposit for one year. You made no deposits or withdrawals. If your bank pays 2.5% interest compounded semiannually, what compound interest will you earn in one year?

Compound Interest Tables

When you calculate compound interest for several interest periods, you can use a compound interest table such as one shown below. The table shows the value of one dollar ($1) after it is compounded for various interest rates and periods.

Compound Interest Table								
	Rate Per Period							
Periods	**0.25%**	**0.50%**	**0.75%**	**1%**	**1.25%**	**1.50%**	**2%**	**3%**
4	1.010038	1.020151	1.030339	1.040604	1.050945	1.061364	1.082432	1.125509
6	1.015094	1.030378	1.045852	1.061520	1.077383	1.093443	1.126162	1.194052
7	1.017632	1.035529	1.053696	1.072135	1.090850	1.109845	1.148686	1.229874
8	1.020176	1.040707	1.061599	1.082857	1.104486	1.126493	1.171659	1.266770
20	1.051206	1.104896	1.161184	1.220190	1.282037	1.346855	1.485947	1.806111
30	1.077783	1.161400	1.251272	1.347849	1.451613	1.563080	1.811362	2.427262
40	1.105033	1.220794	1.348349	1.488864	1.643619	1.814018	2.208040	3.262038

To use the table, find the interest rate per period and the total number of interest periods. The number in the table that corresponds to the interest rate per period (column) and the number of periods (row) is the compound interest multiplier. Use the multiplier to calculate the interest.

EXAMPLE 3

Find the compound interest paid on a $400 deposit that earns interest at an annual rate of 2%, compounded quarterly, for 10 years.

SOLUTION

Find the interest rate per period.

$2\% \div 4 = 0.5\%$

Find the number of interest periods.

4 quarters $\times$ 10 years = 40 periods

Find the multiplier in the compound interest table: 1.220794

$\$400 \times 1.220794 = 488.3176$ or $\$488.32$ compound amount

Find the difference between the compound amount and the original deposit.

$\$488.32 - \$400 = \$88.32$ compound interest

NET Bookmark

Many web sites have compound interest calculators. You can search to find one and try it using the data from Example 3.

CHECK YOUR UNDERSTANDING

E. What compound interest is paid on a $1,100 deposit earning 3% interest, compounded semiannually for 3 years?

F. A deposit of $720 earns 1% annual interest for 7 years. What compound interest will the deposit earn?

If interest is compounded daily, the number of periods for a given time is large. A separate daily interest table gives the multipliers for interest compounded daily. A portion of a daily interest table is given below.

Daily Compound Interest Table

	Annual Interest Rate					
Years	**1%**	**1.25%**	**1.50%**	**2%**	**3%**	**4%**
1/12	1.000834	1.001042	1.001251	1.001668	1.002503	1.003339
1/4	1.002503	1.003130	1.003757	1.005012	1.007528	1.010050
1/2	1.005012	1.006269	1.007528	1.010050	1.015112	1.020200
1	1.010050	1.012578	1.015113	1.020201	1.030453	1.040808
2	1.020201	1.025315	1.030454	1.040810	1.061834	1.083282
3	1.030454	1.038211	1.046027	1.061835	1.094170	1.127489
4	1.040810	1.051270	1.061835	1.083285	1.127491	1.173501
5	1.051270	1.064493	1.077882	1.105168	1.161827	1.221389
6	1.061836	1.077883	1.094172	1.127493	1.197209	1.271232
10	1.105169	1.133146	1.161831	1.221396	1.349842	1.491792
20	1.221399	1.284020	1.349850	1.491808	1.822074	2.225443

STRETCHING YOUR SKILLS Some banks pay interest only on the minimum or smallest balance on deposit during an interest period. Helen Lamb had a balance of $783 in such an account on July 1. Annual interest is 2.7% compounded quarterly. She withdrew $170 on August 17 and deposited $200 on September 12.

23. What was Helen's minimum balance during the quarter?

24. How much interest was she paid on October 1?

25. How much did Helen have on deposit on October 1?

26. CRITICAL THINKING Some people explain compound interest as a way to earn interest on interest. Others say that interest earned is simply added to the previous balance to make a new balance on which interest is computed. Is either view more accurate than the other?

27. CRITICAL THINKING Look at the compound interest table. Why are the amounts in the table not rounded to the nearest cent since all money amount answers are rounded to the nearest cent?

Mixed Review

28. $\frac{4}{5} + \frac{1}{4} + \frac{1}{2}$

29. $\frac{2}{5} \times 20$

30. $\frac{8}{9} - \frac{2}{3}$

31. $\frac{4}{7} \div 16$

32. $100 \times \$26.50$

33. $100{,}000 \times \$32.18$

34. 15 is what percent of 200?

35. 18 is what percent of 240?

36. Find the average of $9.14, $3.83, $1.94, and $4.13.

37. Find the average of $0.90, $0.42, $0.78, $0.13, and $1.25 to the nearest cent.

38. Eva and Trent Blum, a married couple, file a joint tax return for their gross income of $53,000 and claim two exemptions. Their itemized deductions are $3,680. The standard deduction they may use is $10,900. What is their taxable income?

39. Lynn is paid $2.08 for every usable machine part she makes. During one week, she made 220 parts, 14 of which were unusable. What was Lynn's gross pay for the week?

40. Della Lynch is married and earns $470 a week. She claims three withholding allowances. What amount should be deducted from her weekly earnings for federal withholding taxes?

41. Eduardo Rivas works in sales for straight commission. His gross pay of $680 last week was based on his sales of $13,600. What rate of commission was Eduardo paid?

3-2

Checking Accounts

GOALS
- Prepare a deposit slip
- Record entries in a check register

KEY TERMS
- deposit slip
- check register
- balance
- overdrawn

Start Up ▶ ▶ ▶

A 23-year-old college student who lives at home buys two money orders a month to pay her bills. A 42-year-old single mother gets six bills each month. She also pays by money order. If neither of them have a checking account, should they open one to save the cost of buying money orders?

Mona Makeda/Shutterstock.com

Math Skill Builder

Review these math skills and solve the exercises that follow.

1. **Add** money amounts.
Find the sum. $17 + $5.25 + $632.19 = $654.44

1a. $5.60 + $67.49

1b. $294.43 + $123

2. **Subtract** money amounts.
Find the difference. $832.02 − $76.98 = $755.04

2a. $900.35 − $298.37

2b. $1,264.43 − $634.06

2c. $568.32 − $403.99

2d. $1,308.05 − $876.86

3. **Multiply** a money amount.
Find the product. 5 × $20 = $100

3a. 15 × $10

3b. 13 × $0.50

3c. 18 × $3.10

3d. 32 × $1.50

Deposit Slip

Many people deposit cash in a checking account at a bank and make their payments by check. A checking account is safe and easy to use. The statements provided by the bank give you a record of your payments. A **deposit slip** has been filled in for Sherry and Jamal Taylor to deposit their paychecks and other monies.

Cash deposits of *bills* and *coins* are listed on the line labeled CASH. Each check is listed on a separate line in the space for checks.

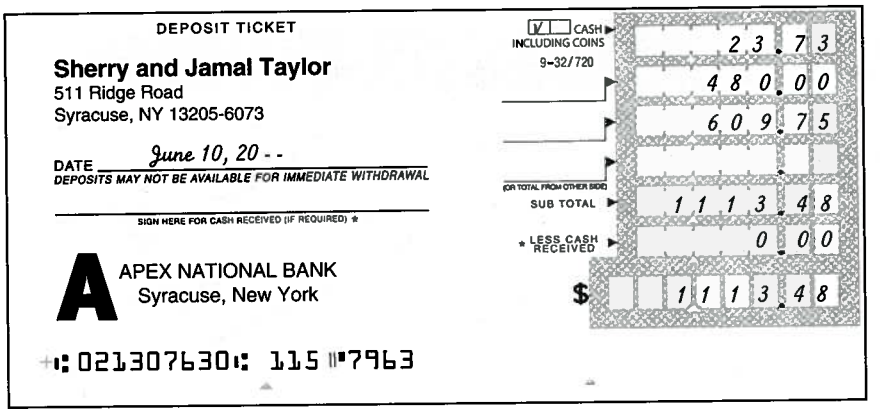
If there are more checks than lines available on the front of the deposit slip, list the additional checks separately on the back of the deposit slip.

The total of those checks is entered on the *Total from Other Side* line on the front of the deposit slip. Then, all the amounts are added to find the sum, which is written on the *Subtotal* line.

To receive *cash back* from the bank, write the amount wanted on the *Less Cash Received* line below the subtotal. Cash back is the amount that you want returned to you in cash.

Math *Tip*

Check all subtraction. The best way to check subtraction is to add the amount subtracted and the difference. The answer should equal the top number.


DEPOSIT TICKET

Sherry and Jamal Taylor
511 Ridge Road
Syracuse, NY 13205-6073

DATE *June 10, 20 - -*
DEPOSITS MAY NOT BE AVAILABLE FOR IMMEDIATE WITHDRAWAL

SIGN HERE FOR CASH RECEIVED (IF REQUIRED) *

APEX NATIONAL BANK
Syracuse, New York

⑆021307630⑆ 115 ⑈7963

CASH / INCLUDING COINS
9-32/720
(OR TOTAL FROM OTHER SIDE)
SUB TOTAL
* LESS CASH RECEIVED
$

	23.73
	480.00
	609.75
	1113.48
	0.00
$	1113.48

Find the *Total Deposit* by subtracting the cash received from the subtotal. The total deposit is sometimes called the *net deposit*. You only sign the deposit slip if you receive cash back and the bank requires a signature.

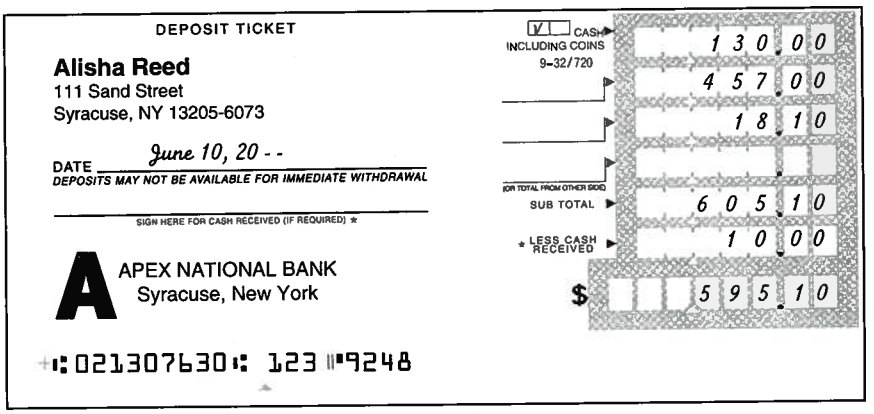
EXAMPLE 1

Alisha Reed made a deposit to her checking account: (bills) 6 twenties, (coins) 40 quarters, (checks) $457 and $18.10. She received 10 one-dollar bills in cash back. Complete a deposit slip.


Photodisc/Getty Images

SOLUTION

Fill in each line with the appropriate amount.


DEPOSIT TICKET

Alisha Reed
111 Sand Street
Syracuse, NY 13205-6073

DATE *June 10, 20 - -*
DEPOSITS MAY NOT BE AVAILABLE FOR IMMEDIATE WITHDRAWAL

SIGN HERE FOR CASH RECEIVED (IF REQUIRED) *

APEX NATIONAL BANK
Syracuse, New York

⑆021307630⑆ 123 ⑈9248

CASH / INCLUDING COINS
9-32/720
(OR TOTAL FROM OTHER SIDE)
SUB TOTAL
* LESS CASH RECEIVED
$

	130.00
	457.00
	18.10
	605.10
	10.00
$	595.10

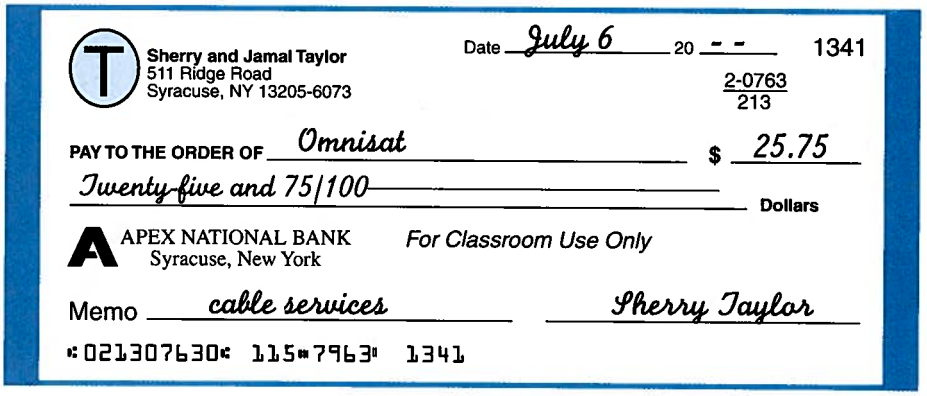
✔ CHECK YOUR UNDERSTANDING

A. Shirley Poe deposited these items into her account at a bank: (bills) 14 twenties; (coins) 21 quarters, 6 dimes; (checks) $322.94, $1.45. She received 100 one-dollar bills in cash back. What was the amount of Shirley's deposit?

B. Charles Gray made a deposit for the booster club at his school. He deposited: (bills) 17 twenties, 18 tens, 9 fives, 37 ones; (coins) 49 quarters, 12 dimes; (checks) $39.86, $3.83. Charles received no cash back. Find the total deposit.

Check Register

When you write a check you direct the bank to make a payment from your checking account. Checks are numbered to make it easy to keep track of checks.



Sherry and Jamal Taylor
511 Ridge Road
Syracuse, NY 13205-6073

Date July 6 20 - - 1341

2-0763
213

PAY TO THE ORDER OF Omnisat $ 25.75

Twenty-five and 75/100 Dollars

APEX NATIONAL BANK
Syracuse, New York

For Classroom Use Only

Memo cable services Sherry Taylor

⑆021307630⑆ 115⑈7963⑈ 1341

The Taylors record each deposit made and check written in their **check register**, shown below. The check register is part of the checkbook in which deposits and checks are recorded.

A new balance, called a *running balance*, is calculated after each entry. Each deposit is added to the previous balance. Each check is subtracted from the previous balance. The **balance** is the amount of money in the account.

CHECK REGISTER

NUMBER	DATE	DESCRIPTION OF TRANSACTION	PAYMENT/DEBIT (-)	√ T	FEE (IF ANY) (-)	DEPOSIT/CREDIT (+)	BALANCE $ 1500 00
1341	7/6	Omnistat	$ 25 75		$	$	1474 25
	7/6	Sherry's Paycheck				480 00	1954 25
1342	7/7	Syracuse Electric	98 32				1855 93
1343	7/7	APEX Mortgage	772 33				1083 60
1344	7/8	Mid-town Appliance	165 98				917 62
	7/10	Jamal's Pay Check				609 75	1527 37

Business *Tip*

Check 21 is a federal law that went into effect in 2004. It allows banks to handle many checks electronically by creating a substitute check instead of relying on the movement of paper checks.

Check 21, as well as other changes in technology, means that checks clear banks faster.

EXAMPLE 2

On October 18, Rico Ortez made a deposit of $250 to his checking account that had a previous balance of $1,288.43. He also wrote Check 67 to Mick's Catering for $78.50 and Check 68 to Bev's Tires for $143.78. Record each transaction and a running balance. What was the final balance in his check register?

SOLUTION

CHECK REGISTER

CHECK NO.	DATE	TRANSACTION	PAYMENT/DEBIT	DEPOSIT/CREDIT	BALANCE
	10/17	Previous Balance			1288 43
	10/18	Deposit		250 00	1538 43
67	10/18	Mick's Catering	78 50		1459 93
68	10/18	Bev's Tires	143 78		1316 15

The final balance is $1,316.15.

✔ CHECK FOR UNDERSTANDING

C. Edwina Moss' check register showed a previous balance of $2,583.45 at the beginning of the week. During the week she made a deposit of $1,220 to her account and wrote checks for $825, $96.40, and $12.78. What final balance did her check register show?

D. Alex Devine made deposits of $500 and $1,236 to his account. He wrote checks for $196, $950, and $87.83. His previous balance before these transactions was $129.74. What was the new balance of his account?

Photodisc/Getty Images

One important reason to record checks and deposits and to keep a running balance in a checkbook register is to keep track of how much money is in the account. If you write a check for more money than is in the account, your account will be **overdrawn**.

Having insufficient funds in your account is called *bouncing* a check and the money will not be paid to the person to whom the check was written. Some banks offer *overdraft protection*, where the bank will transfer money from your savings account into your checking account to cover any check you have written.

Consumer Alert

When a check bounces, the bank returns that check to the person or business to which the check was written. The bank then charges a fee to the person or business who attempted to cash the check.

It is the responsibility of that individual or business to collect the funds and any penalties charged. Businesses usually charge a fee to the person that bounced the check to recover their expenses.

Wrap Up ▶ ▶ ▶

Every financial service is provided at a cost. Money orders are available for a fee and may be bought at a variety of places. Banks offer a variety of checking accounts that have some sort of cost or requirement attached to them, so they also are not free. Both women need to compare the monthly cost of buying money orders and using checking accounts. If the decision is made considering only cost, the student and the single mother should choose the plan that is least expensive for them individually.

Exercises

Solve using the indicated operation.

1. $458.59 + $312.03
2. $1,098.45 + $17.31
3. $1,492.49 − $231.56
4. $248.72 − $9.87
5. 14 × $10
6. 12 × $20

Solve.

7. Eva Lanier deposited these checks into her account: $384.39, $12.44, $284.12. She received no cash back. What was her deposit total?
8. June Wilson's account had a beginning balance of $288.43. She made a deposit of $627 and wrote two checks for $35.87 and $263.56. What was the final balance in her check register?
9. The Singer family had a moving sale. The next day they made this deposit with no cash back: 25 twenties, 19 tens, 28 fives, 18 ones; 15 quarters; and checks for $25, $20, and $85. What was the amount of their deposit?
10. On May 1 Rufus Knight's check register showed a balance of $505.23. Rufus had these transactions: May 4, check written for $34.66; May 7, check written for $98.62; May 9, deposit of $259.34; May 10, check written for $112.97. What was his check register's balance on May 10?
11. Yolanda Downey's checking account balance was $182.63. She made a deposit of $218.55 and wrote checks for $25, $30.17, and $46.07. What was the new balance in Yolanda's check register?
12. Donela Boyd's checking account balance was $3,060.65. A deposit of $1,603.48 was made and checks for $1,780.44, $22.74, $9.10, and $125 were written. What was the new balance of her account?

Photodisc/Getty Images

13. **STRETCHING YOUR SKILLS** All-Sports Trophies made this deposit: 6 hundreds, 14 fifties; and checks for $85, $23.50, $32, $45, $17.50, $147, $17.27, $32.25, $65. They got cash back of 50 one-dollar bills, 20 five-dollar bills, 10 ten-dollar bills, and 8 twenty-dollar bills. Find the total deposit.

14. **CRITICAL THINKING** Assume you have a checking account that sends you a monthly statement by mail. If the bank offers you a discount on your checking account charges if you agree to have your statements sent to you via email, would you take advantage of such an offer to save money? Explain your response.

15. **CRITICAL THINKING** Your bank gives you a choice of ordering either 200 or 400 checks at a time. The cost of 400 checks is double the cost of 200 checks, so there is no cost savings. You write about 14 checks a month. How many checks would you order at one time? Why?

16. **STRETCHING YOUR SKILLS** The Floral Place made this deposit: 72 twenties, 126 tens, 57 fives, 235 ones; 287 quarters, 312 dimes, 48 nickels, 347 pennies; and checks for \$124.68, \$132.08, \$1.29, \$5.79. They received no cash back. Find the total of the deposit.

INTEGRATING YOUR KNOWLEDGE Stuart Rosenblatt earned a gross salary of \$800 in one week. He received a paycheck that showed that taxes and other deductions of \$206.75 were subtracted from his gross salary. Stuart also received an \$82 purchase refund check and a \$200 check from the sale of an old washer and dryer. His previous checking account balance was \$502.87.

17. What was the net amount of Stuart's paycheck?

18. Stuart deposited all the checks and got \$35 cash back. What was his net deposit?

19. What was Stuart's checking account balance after making the deposit and then writing a check to City Garage for \$143.65?

Mixed Review

20. \$24,900.53 + \$3,102.87

21. $\frac{1}{3} + \frac{1}{2} + \frac{1}{8}$

22. \$2,348.81 − \$5.99

23. $8\frac{1}{4} - 3\frac{1}{6}$

24. 249.88 ÷ 1,000

25. 0.14859 × 100 =

26. Find the value of N, to the nearest cent: N = \$352.98 ÷ 100.

27. William earns \$4,000 per month in salary. If his deductions total \$1,350 per month, what percent of his gross pay, rounded to the nearest percent, does William take home?

28. Regina Charren's job pays \$45,300 in annual wages and 31% of annual wages in benefits. Her job expenses are estimated to be \$3,300 a year. Regina interviewed for another job that pays \$47,000 in yearly wages, average benefits of 29.5%, and estimated yearly job expenses of \$3,750. Which job offers Regina the greater job benefits, and how much greater?

29. Elmer Hartley is paid a salary of \$710 a week. What total salary does Elmer earn in one year?

30. At the end of a craft show, Luma Villa deposited her receipts in a checking account: (bills) 19 twenties, 53 tens, 14 fives, 83 ones; (coins), 17 quarters, 1 nickel; (checks) \$64.50 and \$49.25. She got back in cash 3 fifties and \$5 in dimes. What was her total deposit?

3-3

Electronic Banking

GOAL

- Record electronic banking transactions
- Calculate account balance needed to make online payments

KEY TERMS

- electronic funds transfer (EFT)
- automated teller machine (ATM)
- debit card
- direct deposit
- online banking

Start Up ▶▶▶

Your friend, Ronald Billings, received a letter from his bank inviting him to enroll in the bank's online banking and bill paying program. Ronald thinks he would like to use this service. He also wonders whether the monthly charge of $5.95 for online bill paying is worth the cost. What would you say to Ronald that might help him decide what to do?

Photodisc/Getty Images

Math Skill Builder

Review these math skills and solve the exercises that follow.

1. **Add** money amounts.
Find the sum. $873.12 + $12 = $885.12

1a. $18 + $357.38 **1b.** $2,874 + $29.69

2. **Subtract** money amounts.
Find the difference. $1,738 − $622.98 = $1,115.02

2a. $734 − $719.87 **2b.** $287 − $165.45

Electronic Banking

All banks use computers to process transactions electronically. Electronic banking allows bank customers to use telephones, computers, and other technologies in place of paper transactions. Banks use computers to transfer deposits and checks, or "funds," from person to person and bank to bank. This process is called **Electronic Funds Transfer**, or **EFT**.

Individuals can also transfer funds electronically when they use an **ATM** or **Automatic Teller Machine**. By using an ATM card issued by your bank, you can withdraw or deposit money, see account balances, or make transfers between your accounts. A *Personal Identification Number*, or *PIN*, that is known only to you is entered into the ATM before your transaction is processed. The PIN provides protection against unauthorized use of your ATM card.

Your bank's ATM card also allows you to withdraw money at another ATM if it displays the same network logo shown on your card. You may have to pay an ATM fee from your bank and the other bank when you use another bank's ATM.

At many banks, the ATM card is also a **debit card**. Debit cards allow you to pay for your purchases without using cash. When you use your debit card for a purchase, the bank's computer deducts the amount of that purchase automatically from your checking account. You may also use your debit card to receive cash back with a purchase. The amount subtracted from your account is the total of the cash back plus the purchase. Debit cards are sometimes called check cards.

EFTs may also be used to pay monthly bills, such as utility bills. You can instruct your bank to transfer funds automatically each month from your bank account to the account of your utility provider. No checks are written or mailed.

Some companies use EFT to pay their employees by transferring funds directly into their employees' bank accounts without writing any checks to the employees. This is called **direct deposit**.

When you use an ATM or debit card you get a receipt of the transaction. Save the receipt and immediately record the payment or cash withdrawal in your check register.

Many people use the notation "debit" for a debit card purchase and ATM-WD or ATM-DEP for ATM withdrawals or deposits.


Photodisc/Getty Images

EXAMPLE 1

Wan-ying Kuo's checking account had a balance of $512.45 on April 4. Over the next three days she had these electronic transactions: direct deposit of $782.50 on 4/5, ATM cash withdrawal of $100 on 4/6, and debit card clothing purchase of $90.27 on 4/7. What was her final check register balance?

SOLUTION

CHECK REGISTER

CHECK NO.	DATE	DESCRIPTION	PAYMENT/DEBIT		DEPOSIT/CREDIT		BALANCE
	4/4	Previous Balance					512.45
	4/5	Direct Deposit			782.50		1294.95
	4/6	ATM-WD	100.00				1194.95
	4/7	Debit (Clothes)	90.27				1104.68

The final balance is $1,104.68.

✔ CHECK YOUR UNDERSTANDING

A. Fred Wilhelm began the day with a $782.88 balance in his checking account. During the day he used his debit card to pay $85 for car repairs and $86.54 for a clothing purchase. Fred also withdrew $50 from his account at an ATM machine. What was the balance of Fred's checking account at the end of the day?

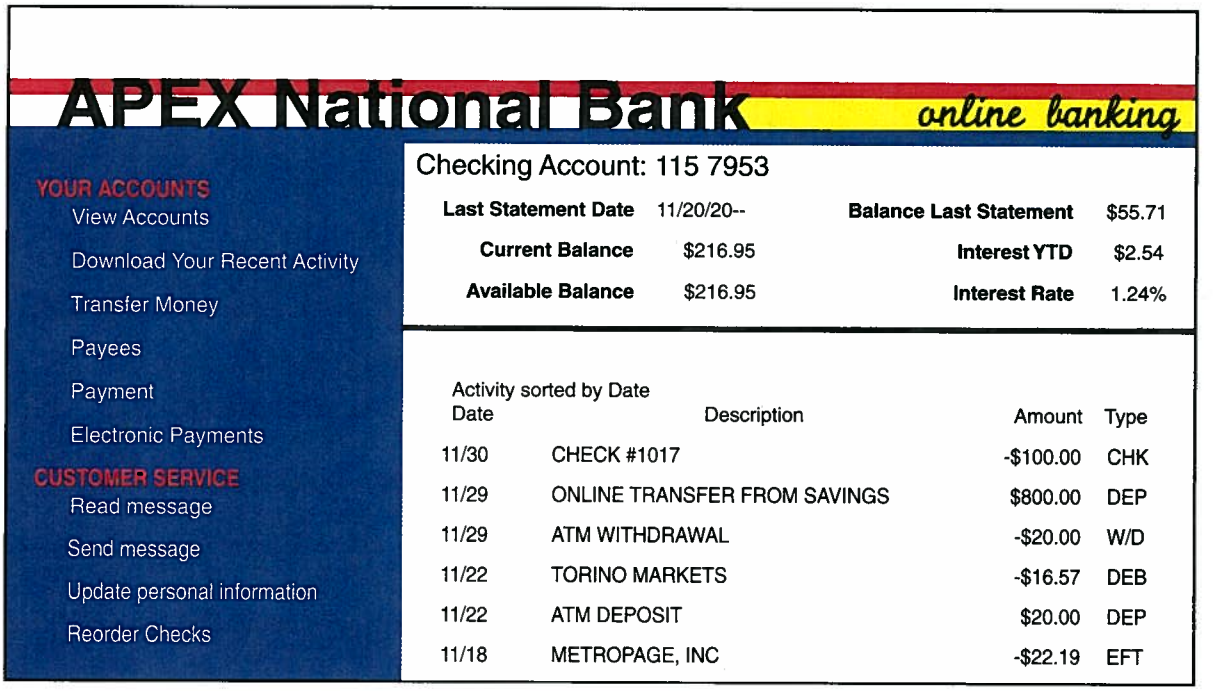
B. In one day Katrina Woll deposited her $890.50 paycheck at an ATM and withdrew $200 in cash. She also made two debit card purchases for $12.87 and $118.94. If she started the day with a bank balance of $1,248.40, what was her balance at the end of the day?

Online-Account Access

Online banking is another form of electronic banking that allows you to do your banking by using your personal computer and the Internet.

Although specific services will vary by bank, the online banking services at most banks allow you to:

- have access to your account 24 hours a day, 7 days a week
- transfer money between your accounts
- have bills sent to you electronically instead of through the mail
- make payments to companies you select
- reorder checks and send messages to bank staff
- look at the history of your accounts



Many banks offer "free online banking" to their customers. This service allows customers to look at their account balances and make transfers between accounts. In many banks, an online bill payment option is available for a monthly fee. A sample online banking screen is shown above.

The sample screen shows the *available balance* of the checking account. This is the amount that is available to spend. Knowing the balance helps you plan future online and check payments. The *account activity* section of the online screen shows the items that have been processed since the last statement date.

Online banking simplifies the banking process, yet is very similar to using a regular checking account. Both require making decisions to manage the account.

EXAMPLE 2

To help her to plan and make decisions, Annie Clark made a worksheet for her checking account that shows the transactions she expects will take place in March.

DIRECT DEPOSIT: $690 each Fri on dates: 03/01, 03/08, 03/15, 03/22, 03/29	**ATM Cash withdrawal of $150 each Saturday**	**DEBIT CARD Purchases each Fri average $280 weekly**	**OTHER CHARGES None**
EXPECTED PAYMENTS			
Electric bill	$ 53.00	due 03/06	
Natural gas bill	$115.00	due 03/22	
Local phone bill	$35.00	due 03/13	
Long distance phone bill	$17.00	due 03/19	
Medical insurance	$108.00	due 03/24	
Internet service	$18.95	due 03/05	
Car payment	$312.40	due 03/13	
Home improvement loan	$367.00	due 03/06	
House payment	$842.00	due 03/20	

On Tuesday, March 5, Annie decides to pay all the bills listed in the "expected payments" section that are due by March 11. Before she makes any payments on March 5, Annie reviews her account balances: checking, $423.90; savings, $1,513. Her last deposit was the March 1 direct deposit.

Will Annie have enough money in her checking account to make the online payments on March 5 and have a balance of at least $100 in the account? If not, how much money will she have to transfer to checking from savings?

SOLUTION

PAYMENT PLAN WORKSHEET, MARCH 5		
1 Checking Account Balance, March 5		423.90
2 Deposits made after March 1		+ 0.00
3 Subtotal (Line 1 + Line 2)		423.90
4 Online payments, debits, paper checks, ATM _WD		
5 Electric bill	53.00	
6 Internet service	18.95	
7 Home improvement loan	367.00	
8 Subtotal of all payments	− 438.95	
9 Difference (Line 3 − Line 8)		(15.05)

Line 1	Enter last available checking account balance.
Line 2	Enter 0.00 to show that no deposits were made after March 1.
Line 3	Add lines 1 and 2.
Line 4	An instruction line that directs you to list any online payments you wish to make, any checks you will write, and any expected ATM withdrawals.
Lines 5–7	Enter bills due from March 5–11. These include the electric bill, Internet service bill, and home improvement loan. (Add more lines as needed.)
Line 8	Take a subtotal of all payments.
Line 9	When Line 8, $438.95, is subtracted from Line 3, $423.90, the result is a negative number, shown in parentheses as (15.05).

There is not enough money to make the payments listed and maintain a minimum balance of $100 in the account. A total of $115.05 ($15.05 + $100) will have to be transferred to checking from savings.

✔ CHECK YOUR UNDERSTANDING

C. The balance of Annie Clark's checking account on March 7 was $100 and her savings account balance was $1,397.95. Use Annie's worksheet to determine if on March 12 she can make online payments for all bills due from March 12 through March 18 and still leave a minimum balance of $100 in the account? If not, how much must she transfer to checking from savings? (Hint: Be sure to include in your calculations any deposits, ATM withdrawals, and debit purchases since the last online payment.)

D. After making his online payments a week ago, Brian Hurley's checking account balance was $67. In the past seven days, he had these transactions in his checking account: deposit, $728; debit card purchases of $36.90 and $112.85; two checks written for $270 and $15. Today Brian is making online payments for boat insurance, $128; charge card, $89.23; and medical bill, $45.50. What will be the balance of his checking account after all the transactions and online payments are entered?

Communication

Banks ask you to select your PIN when they issue an ATM or debit card. Often you don't have much time to think of something that is easily remembered. Assume that your bank asks you to choose a PIN that is six characters long and is alphanumeric, a combination of letters and numbers.

Write guidelines that offer advice to customers that banks should hand out when someone needs to create a personal PIN that cannot easily be guessed by someone who has stolen your card. Be sure to include do and don'ts in your guidelines. Share your guidelines with the rest of the class in an open discussion.

Wrap Up ▶ ▶ ▶

Ronald's bank may have a demonstration program of its online service for him to try. He may also talk with users of online banking and bill paying to find out what their experiences have been. Although the bill pay option may have a monthly fee, Ronald should consider how much money he will save in not having to write checks and pay for postage.

TEAM Meeting

As a class, make a list of area banks, credit unions, and savings and loans that offer online banking services. Class members with Internet access should each choose an institution.

Research web sites and print screen captures that show how the sites function. Also list the services provided online.

The class should review the printouts and list features common to all institutions. Identify those features that are unique to specific banks, credit unions, or savings and loans.

Exercises

Find the sum or difference.

1. $12,873.29 + $2,498.32
2. $387 + $28.07
3. $1,483.87 − $842.38
4. $248.09 − $74.83

Solve.

Photodisc/Getty Images

5. After work Gladys Schroeder used the ATM to deposit her paycheck for $638.77 and to withdraw $200 cash. If her starting bank balance was $418.03, what is her new balance?
6. Adlise Leiber started the day with a bank balance of $343.64. She used another bank's ATM to withdraw $100 cash. The charge for using the ATM was $2.50. Adlise then used her card to make purchases of $85.10, $23.95, and $8.47. Find the balance in her account after the bank processed these transactions.
7. Toni Nicolet's checking account balance on Monday, April 13, is $540; her savings balance is $980. On Tuesday, April 14, she made an ATM withdrawal from checking of $86. On April 15, Toni plans to make these online payments: income tax bill, $823, utility bill, $98, and charge account bill, $127. How much money, if any, will Toni have to transfer into her checking account from savings to cover the online payments and leave a balance of $50 in the checking account?
8. **FINANCIAL DECISION MAKING** Your bank's online banking web site takes 15 seconds longer to load than that of a competing bank, yet costs $1 less per month than a competitor's system. Will you switch banks and pay $1 more a month to get faster service?

Solve.

9. Kwei-tseng Kuo plans to make these online payments: store charge account, $160; charitable donation, $40; rent, $550; and cable bill, $42.01. She began the day with a checking account balance of $16.83. Later that same day she estimated her online payments and transferred $800 into checking from savings to cover the expected payments. What will be the balance of her checking account after the online payments are made?

10. Andrew Galen had a checking balance of $1.39 Monday morning. His net wages of $512.89 were transferred by direct deposit at 11:00 a.m. to his checking account. Later that evening, Andrew made online payments of $3.24, $18.30, $38.96, $100.34, and $314.78. His goal is to keep only a $10 balance in his checking account and have most of his money in savings. How much money was available in Andrew's checking account to be transferred to savings after all the transactions were completed?

11. On Tuesday Henry St. John used a debit card to pay for: garden tools, $83.12; work clothing, $46.75; and groceries, $54.79. If Henry's bank balance was $437.01 at the start of the day, what is his new balance at the end of the day?

12. Gilbert Conroy withdrew $200 from his bank's ATM. On a shopping trip he bought an office chair for $120.87 in cash and paid $75.11 cash for groceries. He then used his debit card to pay for $136.50 in painting supplies and $66.52 for lawn mower repair. What amount was left in Gilbert's account if it had a balance of $740.12 at the start of the day?

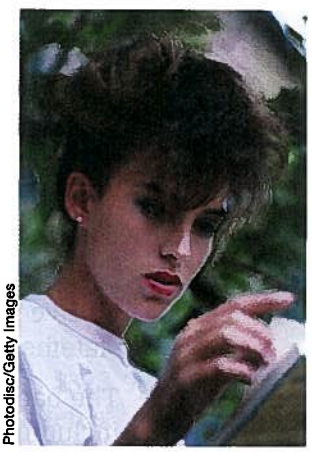
13. **CRITICAL THINKING** Molly Abrams will begin receiving Social Security monthly benefits that the law requires be paid by direct deposit. Molly is used to getting a paper paycheck and going to a bank to cash her check. Molly would prefer to receive her benefits in a paper check. What advantages of direct deposit could you tell Molly about that might convince her that direct deposit is better?

Mixed Review

14. Divide: $8{,}008 \div 13$

15. Multiply: $2\frac{2}{9} \times 8\frac{3}{5}$

16. Jeanne Williams sells welding equipment and is paid commission every two months. She earns 9.5% on the first $25,000 of sales and 12.4% of sales from $25,001 to $70,000. A commission of 15.1% is paid on all sales over $70,000 in a pay period. Her sales last month were $43,000 and $54,000 this month. What total commission earnings, to the nearest dollar, did Jeanne have for the two months?



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17. Justin Niklas made this deposit to the Breakfast Book Club's checking account: (bills) 43 ones, 13 fives; (coins) 9 quarters, 3 half-dollars, 5 dimes, 4 nickels, 12 pennies; (checks) $397.42, $192.81. Find the amount of the deposit.

18. The city of Dubline has this income tax schedule for earnings of $46,000 to $58,000: $460 plus 1.25% of earnings over $46,000. What income tax will Jules Rubin have to pay on earnings of $53,400?

3-4

Check Register Reconciliation

GOALS

- Reconcile a bank statement
- Reconcile and correct a check register
- Reconcile a checking account with outstanding transactions and other errors

KEY TERMS

- bank statement
- service charge
- outstanding checks
- reconcile

Start Up ▶ ▶ ▶

Two people are discussing a historical event. The more they talk, the more they disagree about when the event took place, the parties involved, and the outcome. You are asked to settle, or reconcile, the dispute. How would you do this?

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Math Skill Builder

Review these math skills and solve the exercises that follow.

1. **Add** money amounts.
   Find the sum. $23,487 + $15.34

   1a. $20.08 + $832.58

   1b. $85.82 + $70.18

2. **Subtract** money amounts.
   Find the difference. $76.28 − $5.39

   2a. $900 − $2.08

   2b. $175.29 − $38.43

Reconcile the Bank Statement

Banks keep track of checking account transactions and send a monthly report, called a **bank statement**, to depositors. At many banks, you have the option to receive paper statements through the mail or online statements. A sample bank statement for Gerald Booth is shown on the next page.

The bank statement shown lists (1) nine *checks* paid by the bank; (2) four *deposits*, including interest earned, (3) and two *other charges*, an ATM withdrawal and a service charge.

Interest earned is money paid to customers for the use of their money. A **service charge** is a deduction made by the bank for handling the checking account.

Gerald Booth compared the bank statement with his check register. On the bank statement he placed a check mark next to the number of the check when both records agreed.

TRENT NATIONAL BANK
4309 SOUTH BROAD STREET
PHILADELPHIA, PA 19148-3978

09/01	Balance Brought Forward	$ 608.12
	+ Deposits	884.71
	– Checks	1103.85
	– Other Charges	65.00
09/30	Closing Balance	$ 323.98

Gerald Booth
3123 Baltimore Avenue
Philadelphia, PA 19101

Checks

Check	Date	Amount	Check	Date	Amount	Check	Date	Amount
√1072	09/02	34.67	√1075	09/20	7.90	√1078	09/22	61.90
√1073	09/10	8.32	√1076	09/17	311.01	√1079	09/28	450.00
√1074	09/09	125.54	√1077	09/27	26.19	√1082	09/30	78.32
						Total Checks		**1103.85**

Deposits

Date	Explanation	Amount
√09/12	ATM Deposit	481.56
√09/25	Deposit	298.44
√09/28	Deposit	104.55
x09/30	Interest Earned	0.16
	Total Deposits	**884.71**

Other Charges

√09/17	ATM Withdrawal	50.00
x09/30	Service Charge	15.00
	Total Other Charges	**65.00**

Gerald found two checks (numbers 1080 and 1081) that were recorded in his check register, but that were not listed on the statement. These checks are called **outstanding checks**. This means that the checks have not yet been received or paid by the bank.

Gerald also placed a check mark next to each deposit shown on the statement that appeared in his check register. Since all deposits were accounted for, there were no *outstanding deposits.* An outstanding deposit occurs when a deposit is made after the closing date of the bank statement and the deposit is recorded in the check register.

Gerald also placed a check mark next to the ATM withdrawal because it was recorded in his check register. The letter "X" was placed next to the interest earned and the service charge, items that were not recorded in the check register. Gerald's statement shown above is already marked.

When Gerald Booth looked in his check register, he found his last recorded balance for September to be $196.89. The final balance on his bank statement was $323.98. The difference in the balances was the result of the outstanding checks, interest earned, and the service charge.

To bring both balances into agreement and to make sure the bank's records were correct, Gerald Booth has to **reconcile** both records. This is a two-step process. The first step is to reconcile the bank statement. To help him, Gerald can complete the reconciliation form printed on the back of the bank statement.

EXAMPLE 1

Prepare a reconciliation form for Gerald Booth to reconcile the bank statement.

SOLUTION

Complete the reconciliation form.

Reconciliation Form

Follow these steps:		Outstanding Checks	
1 Enter Closing Balance from Statement	$ 323.98	1080	$48.65
2 Add any deposits outstanding	+ 0.00	1081	$93.28
3 Add lines 1 and 2	= 323.98		
4 Enter total of Checks Outstanding	− 141.93		
5 Subtract line 4 from line 3. This amount should equal your check register balance.	$ 182.05	Total	$141.93

Follow these steps to complete the form:

1. List separately the outstanding checks in the "Outstanding Checks" column.
   Find their total, $141.93.
   Write it in Line 4.
2. Write the closing bank statement balance of $323.98 on Line 1.
3. Write 0.00 on Line 2 to show no "Deposits Outstanding."
4. Do the addition shown on Line 3.
5. Do the subtraction shown on Line 5.
   The result, $182.05, is the "reconciled" bank balance. Since $182.05 does not agree with Gerald Booth's check register balance of $196.89, he will have to also reconcile the check register.

Business *Tip*

Outstanding items (checks and deposits) are items that you have recorded in your check register but the bank has not yet received. That means they have not subtracted outstanding checks from the bank balance nor added outstanding deposits to the bank balance. These are two reasons why your balance doesn't match the bank's balance.

✔ CHECK YOUR UNDERSTANDING

A. Maria Greeley's bank statement showed a closing balance of $1,383.53, no outstanding deposits, and two outstanding checks for $129.45 and $87.39. Reconcile her bank statement.

B. Xavier Allasandro had a closing balance of $793.57 on his bank statement. The outstanding items were: a deposit of $312.09, Check 278 for $174.85, and Check 280 for $32.78. Reconcile his bank statement.

Reconcile the Check Register

After reconciling his bank statement balance, Gerald Booth found that it still did not agree with the check register balance. The next step is to reconcile his check register.

EXAMPLE 2

Record transactions from the bank statement in Gerald Booth's check register to reconcile the register.

SOLUTION

CHECK REGISTER

CHECK NO.	DATE	DESCRIPTION	PAYMENT/DEBIT			DEPOSIT/CREDIT		BALANCE	
	9/30	Previous Balance						196	89
	9/30	Interest Earned				0	16	197	05
	9/30	Service Charge	15	00				182	05

The $0.16 interest earned was added to the account by the bank so it also must be added to the balance in the check register. The $15 service charge was deducted from the account by the bank. The service charge must also be deducted from the check register.

The final balance of $182.05 shown in the check register agrees with the final balance of $182.05 shown on the bank's Reconciliation Form. The account is reconciled.

Business *Tip*

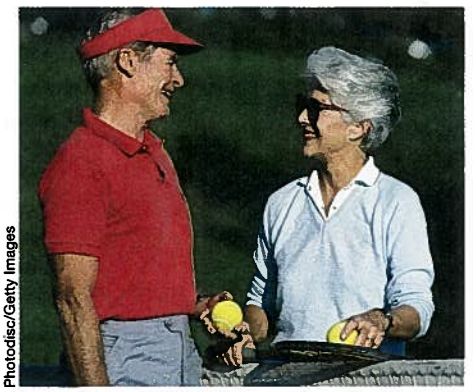
Many people use a computer program to record their checkbook transactions. Most programs have a feature that walks the user through the reconciliation process.

It is important that if you use a computer program for your banking, that you make backup copies of your data.

✔ CHECK YOUR UNDERSTANDING

C. Mildred Galin's previous check register balance was $727.92. Her bank statement showed a service charge of $18.90 and interest earned of $1.60. Reconcile her check register.

D. Ludwik Sirros had a balance of $457.38 in his check register. His checking account does not pay interest. His bank statement showed a $7.68 service charge. Reconcile his check register.



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Reconciliation Problems

Sometimes you must reconcile a bank statement and check register balances when deposits, checks, and EFT transactions are not recorded and when other errors are made.

To understand this process, use Rena Jackson's July bank statement dated August 6. The bank statement is shown on the next page.

Rena compared each item in the check register with each item on the bank statement. On the bank statement she placed a check mark next to the items when the two records agreed.

An "X" was placed next to those items that needed to be investigated. Rena's bank statement is already marked.

NC *North-Central National Bank*

07/01	Balance Brought Forward	$ 822.53
	+ Deposits	1366.70
	– Checks	1012.84
	– Other Charges	544.08
07/31	Closing Balance	$ 632.31

Rena Jackson
111 Central Drive
Indianapolis, IN 46110

Checks

Check	Date	Amount	Check	Date	Amount	Check	Date	Amount
√845	07/01	72.66	√848	07/13	8.90	X853	07/19	72.05
√846	07/05	18.31	√849	07/16	428.00	√854	07/20	215.67
√847	07/08	96.91	X851	07/19	37.16	√855	07/23	63.18
						Total Checks		**$ 1,012.84**

Deposits

Date	Explanation	Amount
√07/10	Direct Deposit	623.47
√07/24	Direct Deposit	623.47
X07/28	ATM Deposit	118.20
X07/31	Interest Earned	1.56
	Total Deposits	**$ 1,366.70**

Other Charges

X07/12	ATM Withdrawal, Trent County Bank	120.00
X07/12	ATM fee, Trent County Bank 1.50	
X07/18	EFT Payment, Truck Loan	416.18
X07/31	DEBIT, All Repair Parts Inc.	6.40
	Total Other Charges	**$ 544.08**

EXAMPLE 3

Reconcile Rena Jackson's bank statement and check register.

SOLUTION

Step 1: Compare the bank statement to the check register and note any differences between them.

Rena's notes about the items where she found a problem are listed.

1. Outstanding checks
   - Check 850 for $8.12
   - Check 852 for $34.28
2. Outstanding deposits
   - Deposit of $85 made on 8/1
3. Transactions not recorded in the check register
   - Check 851 for $37.16 cashed 7/19
   - ATM deposit of $118.20 made on 7/28
   - Interest of $1.56 earned
   - ATM withdrawal of $120 on 7/12
   - ATM fee of $1.50 charged on 7/12
   - EFT loan payment of $416.18
   - Debit charge of $6.40

Photodisc/Getty Images

4. Errors
   - Check 853 for $72.05 was recorded as $27.05 in the checkbook register

Step 2: Prepare a reconciliation form to reconcile the bank statement.

Reconciliation Form

Follow these steps:		Outstanding Checks	
1 Enter Closing Balance from Statement	$ 632.31	850	$ 8.12
2 Add any deposits outstanding	+ 85.00	852	$34.28
3 Add lines 1 and 2	= 717.31		
4 Enter total of Checks Outstanding	− 42.40		
5 Subtract line 4 from line 3. This amount should equal your check register balance.	$ 674.91	Total	$42.40

The August 1 deposit of $85 not on the July 31 bank statement was added and the two outstanding checks subtracted from the closing balance to reconcile the bank statement.

Step 3: Reconcile the check register.

Check Register

CHECK NO.	DATE	DESCRIPTION OF TRANSACTION	PAYMENT/DEBIT (-)	√ T	FEE (IF ANY) (-)	DEPOSIT/CREDIT (+)	BALANCE
		Previous Balance	$		$	$	1181 39
		Ck 851, July 19	37 16				1144 23
		Ck 853 (wrong amount)				27 05	1171 28
		Ck 853 (correct amount)	72 05				1099 23
		ATM-DEP				118 20	1217 43
		Interest earned				1 56	1218 99
		ATM-WD	120 00				1098 99
		ATM fee	1 50				1097 49
		EFT payment, truck loan	416 18				681 31
		Debit	6 40				674 91

Line 1 The previous balance of $1,181.39 is the last balance in the check register before the reconciliation begins.

Line 2 Record unrecorded Check 851 for $37.16.

Line 3 Check 853 was recorded incorrectly as $27.05. The $27.05 had to be added back into the check register to cancel the error.

Line 4 The correct amount for Check 853 was recorded as $72.05.

Line 5 Record the unrecorded ATM deposit of $118.20.

Line 6 Add interest earned of $1.56 to the register.

Line 7 Record the unrecorded ATM withdrawal of $120 in the register as a payment.

Line 8 Record the unrecorded ATM fee of $1.50 in the register as a payment.

Line 9 Record the unrecorded EFT payment of $416.18 in the check register.

Line 10 Record the debit charge of $6.40 in the register as a payment.

The final balance of $674.91 shown in the Reconciliation Form agrees with the final balance of $674.91 shown in the check register. The checking account is reconciled.

✔ CHECK YOUR UNDERSTANDING

E. On January 30, your check register balance is $107.87 and your bank statement balance is $161.96. Interest earned of $0.43 and an ATM deposit of $56 also appeared on the statement but had not been recorded in the register. You also find that Check 307 for $35.29 had been entered in the register as $32.95. Reconcile the checking account.

F. At the end of October, Allen Springer's check register balance was $812.45. His bank statement balance was $624.77. An examination of his statement and check register showed that an ATM withdrawal of $200 had not been entered in the register, Check 201 for $92.49 was outstanding, and Check 202 for $80.17 was cashed but not recorded in the register. Reconcile the checking account.

Calculator *Tip*

When reconciling your checking account, another error may be created if you incorrectly use a calculator. Be sure to double check all calculations.

Communication

Many employers rely on a Standard Operating Procedure (SOP), which is a guide for all employees to follow in making decisions and completing tasks. The SOP is generally used so that the everyday activities of a company are done consistently even when personnel changes.

The Standard Operating Procedures must be clearly and precisely written. Procedures that are unclear can lead to misunderstandings between the expectations of employers and the performance of employees.

The procedures may also define how employees are to interact with customers. Misunderstandings with customers can lead to a damaged business relationship and a loss of sales.

Prepare a Standard Operating Procedure on how to reconcile a checking account. Assume that you manage a team of bookkeepers and all accounts must be reconciled in the same manner. Your Standard Operating Procedure will serve as guidelines for all who work for you.

Wrap Up ▶ ▶ ▶

One way to settle disagreements is to collect and present the facts. Historical records contain information about the event. Presenting the facts to the people who do not agree is a way to begin reconciling the disagreement.

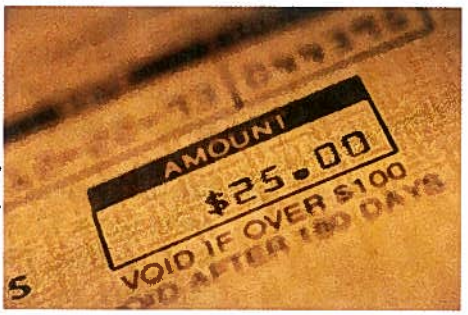
Exercises

Find the sum or difference.

1. $874.20 + $392.29
2. $125.62 + $1.23 + $72.76
3. $17,800.23 − $2,893.98
4. $274.65 − $110.38

Solve.

5. The bank statement of Dottie Weigand showed a closing balance of $3,150.18. The transactions outstanding included three checks for $12.87, $39.47, and $840. Reconcile Dottie's bank statement.
6. Roger Korsak's check register balance was $745.84. His bank statement showed an ATM deposit of $82.67 that was not recorded in his check register, interest earned of $0.87, and an $18 charge for printing new checks. Reconcile Roger's check register.
7. Phoebe Duncan's check register balance on November 30 was $984.09. Her November 30 bank statement showed a balance of $1,462.25. Checks outstanding were 207 for $298.12, 209 for $86.73, and 210 for $105.03. The bank service charge for November was $12.80 and the interest earned was $1.08. Reconcile Phoebe's check register.
8. On May 31, Sue Ware's check register balance was $289.30 and her bank statement balance was $375.37. Checks outstanding were: 543, $86.24; 543, $12.82; and 547, $57.67. A late deposit on June 1 for $68.50 was not on the statement. The statement showed an ATM fee of $2.50 and interest earned of $0.34.



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9. On March 31, Goro Hayashi's check register balance was $277.37 and his bank statement balance was $289.23. The statement showed an ATM service charge of $1.25. Checks 85 for $5.37 and 90 for $73.09 were outstanding. Goro also found that he had recorded Check 87 for $20.75 twice in the check register and did not record Check 93 for $86.10.
10. On May 30, Amy Millard's check register showed a balance of $700.61. Her bank statement balance on that date was $1,143.90. The "other charges" part of the statement showed that an EFT car loan payment of $250 was not recorded in the register. Checks outstanding were: 834 for $48.33, 837 for $21.19, 838 for $161.77. A direct deposit of $480 was not recorded in the check register. Check 836 for $86.40 was recorded as $68.40.
11. **CRITICAL THINKING** What would you do if you found that you wrote a check for $78, but it was recorded by the bank as $87?
12. **FINANCIAL DECISION MAKING** Suppose you made a contribution to a charity by check in December. You just received your March bank statement and found the check to be outstanding. If the check is outstanding for several months, can it still be cashed by the charity? Do you need to take any action?

Mixed Review

13. $\frac{3}{4} \times \frac{8}{15} =$

14. $12\frac{3}{4} - 3\frac{1}{8} =$

15. Rewrite 0.8 as a fraction

16. Find 75% of 140

17. Estimate the quotient: 6,132 ÷ 42

18. Divide to the nearest hundredth: 995 ÷ 7.4

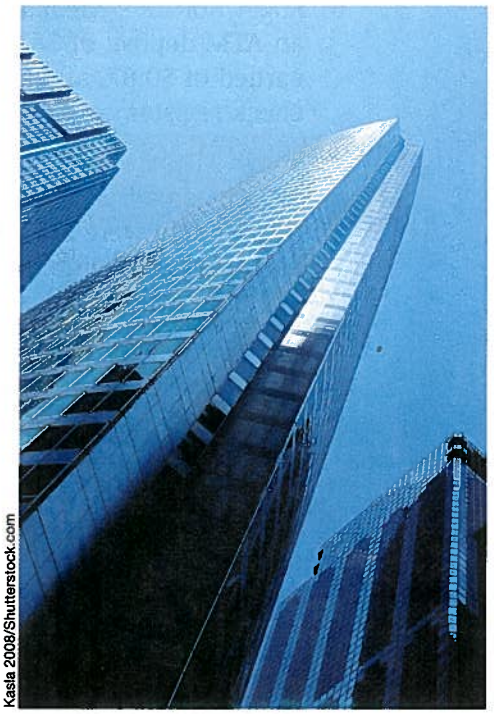
19. Round 5,437 to the nearest 10, and then to the nearest 100.

20. Emma's bank statement's closing balance on March 31 is $683. There were three checks outstanding for: $12.33, $8.32; $19, and $274.90. Reconcile Emma's bank statement.

21. Elrod York is paid a 5% commission on all monthly sales. His monthly sales average $82,000. What total commission is he likely to earn for the year?

22. The city in which Leah Zang-Clouse works has a 1.25% tax on all income. What total city income taxes must she pay if her income for a year is $38,200?

23. Kristin Thomas' job expenses last year were: tools, $1,250; work supplies, $180; work clothes, $360; union dues, $480; truck expenses, $3,800. Her total job benefits for the year were $48,000. Find Kristin's net job benefits.



Kasta 2008/Shutterstock.com

24. The owner of a hospital supply company bought four new trucks of different sizes. Their purchase prices were $28,430, $21,692, $22,572, and $25,870. What average price per truck did the owner pay?

25. McCarther Williams, a waiter, wrote $430 in breakfast checks one morning. His tips average 11% of the total checks. What was his tip income for the morning?

26. Elva Rainey is single and has taxable income of $23,810. Her employer deducted $3,718 in withholding taxes for the year. Find Elva's tax due and any refund or amount owed. Use the tax tables in Chapter 2.

27. Walker Levin is paid a 2.75% commission on all sales over $5,500 each week. Last week his sales were $12,650. On how much of his sales did he earn commission and what was the amount paid to him in commission?

28. An assistant chef is paid $120 for every day she works. What is her gross pay for a month in which she works 25 days?

3-5

Money Market and CD Accounts

GOALS

- Calculate interest earned on special savings accounts
- Calculate the penalty for early withdrawals from CD accounts
- Compare the interest earned on savings accounts
- Calculate the effective rate of interest

KEY TERMS

- certificate of deposit (CD)
- term
- maturity date

Start Up ▶▶▶

Banks often pay a higher interest rate on savings accounts to customers who keep their money on deposit for a fixed period of time, such as a year, and do not make any withdrawals. Name reasons why banks encourage people to use such savings accounts.

Photodisc/Getty Images

Math Skill Builder

Review these math skills and solve the exercises that follow.

1. **Subtract** money amounts.
   Find the difference. $705.46 − $700 = $5.46

   1a. $870 − $8.78 **1b.** $265.38 − $187.46

2. **Multiply** money amounts by a percent and round.
   Find the product. 2.13% × $673 = 0.0213 × $673 = $14.334, or $14.33

   2a. 4.7% × $547 **2b.** 2.9% × $992

3. **Multiply** money amounts by a fraction and round.
   Find the product. $\frac{1}{4} \times \$27.34 = \$6.835$, or $6.84

   3a. $\frac{1}{2} \times \$68.46$ **3b.** $\frac{1}{12} \times \$56.89$

Special Savings Accounts

In addition to regular savings accounts, many banks also offer special savings accounts for long-term savers or those who keep large savings account balances. The interest rates paid on these special savings accounts are higher than the rates paid on regular savings accounts.

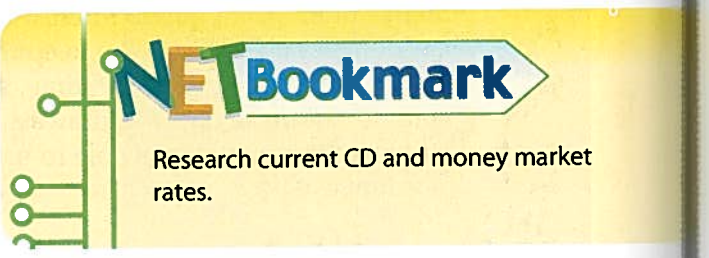
The **certificate of deposit** is widely referred to as a CD. The CD is also known as a *time deposit* or a *savings certificate.* Some government rules apply to certificate of deposit accounts.

In exchange for a fixed higher rate of interest, banks require depositors to:

- Deposit a minimum amount. This may be $500, $1,000, $5,000, or $10,000.
- Leave the money on deposit for a specified time. The time may be specified in number of days, months, or years. The minimum time is called the **term**. The date that marks the end of the term is the **maturity date**.
- Pay a penalty if money is withdrawn before the end of the term. Most CD accounts can be set up so that the interest is paid out of the account each period with no penalty. This kind of CD is called a simple interest CD.

Like certificates of deposit, money market accounts offer higher interest rates than regular accounts. Special rules apply:

- A minimum balance must be kept in the account. More money may be added to the account at any time.
- The interest rate paid varies with the economy.
- A small number of checks may be written against the account.



Banks usually pay a higher interest rate for larger minimum balances. Money may be withdrawn as long as the minimum balance is maintained. If the minimum balance is not kept, a lower interest rate will be paid or a fee may apply.

EXAMPLE 1

Nick Bolger has a $1,200 six-month simple interest CD that earns quarterly interest at an annual rate of 4%. How much interest does Nick receive each quarter? How much interest does Nick earn for 6 months?

SOLUTION

Use $I = PRT$ to find interest for each 3-month term.

$I = \$1{,}200 \times 0.04 \times \frac{3}{12} = \$12$ interest for each 3-month period

$\$12 \times 2 = \$24$ total interest earned for six months

✔ CHECK YOUR UNDERSTANDING

A. Rose Bannon deposited $10,000 in a three-year certificate of deposit that pays simple interest at a fixed annual rate of 5.4%. What total interest will Rose have earned at the end of three years?

B. Alex Nugent had $2,000 on deposit for March and April in a money market account. Interest in the account is paid monthly. In March, the account paid 3.5% annual interest. In April, an annual interest rate of 3.75% was paid. Alex had no other deposits or withdrawals from the account. What total interest did Alex earn for the two months?

Penalties on Certificates of Deposit

By law, banks must charge depositors a penalty for withdrawing money early from a certificate of deposit. Each bank sets its own penalty for early withdrawals. The penalty usually varies with the term of the certificate. For example, a 1-year CD may carry a penalty of 3 months' interest.

If you want to withdraw money from a CD, most banks will require you to cash out the entire CD. You will receive the principal and interest, minus the penalty for early withdrawal.

EXAMPLE 2

Ella Trane invested $5,000 in a 4-year CD that paid 5.2% annual interest. When she cashed out the CD at the end of 3 years, her early withdrawal penalty was 6 months' simple interest. What was the amount of the penalty?

SOLUTION

Use $I = PRT$ to find the penalty.

$I = \$5{,}000 \times 0.052 \times \frac{6}{12} = \$130$ six months' interest penalty for early withdrawal

✔CHECK YOUR UNDERSTANDING

C. Neil Richards has $2,000 in a one-year time-deposit account that pays an annual interest rate of 2%. Neil cashed out the CD early. The bank charged Neil 3 months' simple interest for the early withdrawal. What penalty did Neil pay?

D. Noelle Hastings' 5-year savings certificate pays an annual interest rate of 4.7%. At the end of the first year she cashed out the $12,000 CD and paid a penalty of 12 months' simple interest. What penalty did she pay?

Compare Savings Accounts

Savings accounts are often compared by the interest earned in each account. To compare, calculate the interest that would be earned by each type of account for the same time period.

Math *Tip*

You can use the Daily Compound Interest Table on p. 83 to find the interest on the savings account.

EXAMPLE 3

In one year, you could earn $18.18 interest on a $900 deposit in a savings account paying 2% daily interest. The $900 could be deposited in a one-year CD paying simple interest at 4.7% annually. How much more interest could you earn in one year by placing your money in a CD?

SOLUTION

Savings account: $18.18 one year's interest

CD: $\$900 \times 0.047 \times 1 = \$42.30$ one year's interest

Find the difference between the interest earned on each account.

$\$42.30 - \$18.18 = \$24.12$ more interest earned by CD

✔ CHECK YOUR UNDERSTANDING

E. A six-month time-deposit account pays 5.35% simple interest. Dora has already calculated that she could earn $10.54 in six months on a $1,400 deposit in a savings account earning 1.5% daily interest. How much more interest could Dora earn if she deposited the $1,400 in the time-deposit account instead of a savings account for 6 months?

F. Jim Russell's $1,500 deposit could earn $18.87 in 12 months in a savings account paying 1.25% daily interest. How much more interest could Jim earn in a 3-month CD that pays 3.26% simple interest every 3 months during the 12-month period?

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Effective Rate of Interest

The effective rate of interest is the rate you actually earn by keeping your money on deposit for one year. The annual rate and the effective rate you earn can be different. The effective rate is sometimes referred to as the *annual percentage yield.*

$$\textbf{Effective Rate of Interest} = \frac{\textbf{Interest Earned in One Year}}{\textbf{Principal}}$$

Algebra Tip

Effective rate of interest can be calculated using the formula $ER = \frac{I}{P}$ where ER is the effective rate of interest, I is the interest earned in one year, and P is the principal.

EXAMPLE 4

Find the effective rate of interest to the nearest hundredth percent on $1,000 deposited in an account that pays 5% annual interest, compounded quarterly. Use the compound interest table given in Lesson 3-1.

SOLUTION

5% ÷ 4 = 1.25%

Find the multiplier in the compound interest table: 1.050945

Multiply the deposit amount by the multiplier.

$1,000 × 1.050945 = $1,050.945, or $1,050.95 compound amount

Find the difference between the deposit and the compound amount.

$1,050.95 − $1,000 = $50.95 interest earned in one year

Divide the interest earned for one year by the principal. Round as directed.

$ER = \frac{\$50.95}{\$1,000} = 0.05095$, or 5.1% effective rate of interest


Photodisc/Getty Images

✔ CHECK YOUR UNDERSTANDING

G. A deposit of $2,000 is kept in an account that pays 4% annual interest, compounded quarterly. Find the effective rate of interest to the nearest hundredth percent if the money is on deposit for 1 year. Use the compound interest table.

H. A CD pays 4% yearly interest and compounds interest daily. Find the effective rate of interest to the nearest tenth percent if $6,000 was on deposit for 1 year. Use the daily compound interest table.

Wrap Up ▶ ▶ ▶

When an account has a fixed term, such as a year, banks spend less money on personnel and other costs of processing withdrawals or deposits. In turn, the bank can lend the money to a borrower for a longer period of time since they know the money on deposit is not likely to be withdrawn during the term of the deposit.

Communication

Visit a local bank or the Internet site of a bank not in your area to find the types of certificates of deposit offered. Create an overhead transparency that shows the bank name, term of deposit, interest rate, and minimum deposit amount. Write a sentence about the relationship of the length of the term and the interest rate.

When preparing visual presentations, keep in mind the following hints:

- Keep your design simple.
- Include only one bank per visual.
- To maximize effectiveness, be selective in how much information you include on the page.
- Proofread visuals carefully.
- Make sure visuals are large enough to be seen by the entire audience.
- Avoid distorting facts on visuals; be clear and concise.
- When presenting at the overhead, position yourself so the audience may clearly view the visual.
- Make an effort to talk about the data rather than read your visual line by line.

Exercises

Find the sum or difference.

1. $7.58 + $8.34 =

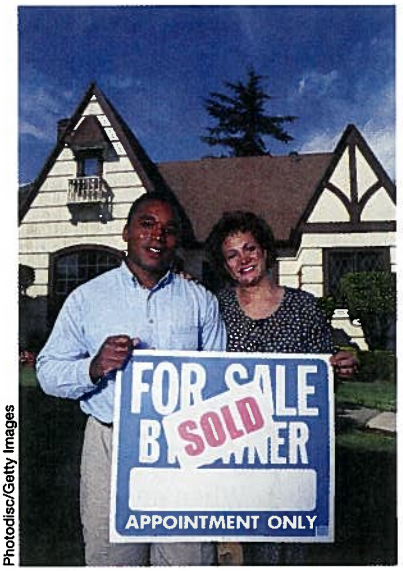
2. $1,430.67 + $78.34

3. $7,757.82 − $257.82

4. $45.63 − $28.08

Find the product and round to the nearest cent.

5. $4.26\% \times \$720$
6. $2.78\% \times \$1{,}570$
7. $\frac{1}{2} \times \$27.83$
8. $\frac{1}{12} \times \$87.65$



Photodisc/Getty Images

Solve.

9. How much interest will you earn per quarter on a 4.5% simple interest CD where interest is paid out quarterly, if you have $1,000 on deposit?
10. A money market account paid annual interest of 4.8% in June and 4.91% in July. A two-month, time-deposit account pays 4.87% annual interest. Which account would have earned more interest if $15,000 were left on deposit in each account for 2 months? How much more?
11. Magda Saleto had a three-month savings certificate that paid simple interest at 2.67% on her $12,000 deposit. At the end of three months she invests the original $12,000 in another certificate with a one-month term that pays 2.83%. What total interest will she have earned from both certificates at the end of four months?
12. A $500 investment in a 12-month CD with an interest rate of 4.89% compounded monthly, earns $25.01 interest in one year. What effective rate of interest does this investment earn?
13. **CRITICAL THINKING** A money market account may pay interest of 3.25% provided that a minimum balance of $2,500 is kept on deposit. A deposit that falls below the minimum, to $2,498 perhaps, earns 1% interest. Why is there such a large difference in the rates?
14. **FINANCIAL DECISION MAKING** You sold your house with net cash received of $40,000. You did not need the money for at least two months. You could deposit the $40,000 in a 12-month CD that pays 4.2% simple interest and has an early withdrawal penalty of three-months' interest. You could also deposit the money in a money market account that pays 2% interest, compounded daily. In which account would you deposit your money to earn the most interest if you plan to withdraw the money at the end of the third month?

Mixed Review

15. $907 + 48 + 412 + 62$
16. $\$867.38 - \$20.09$
17. Write 0.0345 as a percent.
18. $4\frac{2}{3} \div 1\frac{1}{9}$
19. A truck farmer brought 200 pints of berries to sell in a market during each week of the growing season. She sold 80% of the berries the first week and 90% the second week. She sold all the berries in each of the next three weeks. What average number of pints of berries did the farmer sell per week during the five-week period?
20. Jack Nesbitt worked 52.5 hours last week. He is paid $11.29 per hour for regular-time work and time-and-a-half overtime for hours worked past 40 hours in a week. What gross pay did he earn last week?

3-6

Annuities

GOALS

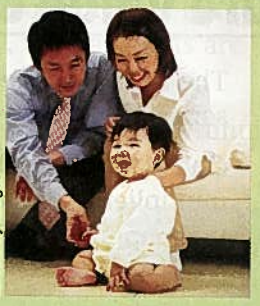
- Calculate the future value of an ordinary annuity
- Calculate the present value of an ordinary annuity

KEY TERMS

- annuity
- future value of an annuity
- present value of an ordinary annuity

Start Up ▶ ▶ ▶

Manuel and Germaine Montez have a new baby. Each month from the baby's birth, they deposit $50 in an account to pay for the baby's college expenses. If the money earns 5% interest compounded monthly, how much can they expect to have in the college account when the child is 18?



DAJ/Getty Images

Math Skill Builder

Review these math skills and then answer the questions that follow.

1 **Divide** whole numbers and decimals.
Find the quotient. $6 \div 4 = 1.5$

1a. $3 \div 4$

1b. $2.5 \div 4$

1c. $1 \div 5$

1d. $3.5 \div 8$

2 **Multiply** money amounts by decimals and round to the nearest cent.
Find the product. $\$400 \times 5.67234 = \$2{,}268.94$

2a. $\$650 \times 1.907534$

2b. $\$25 \times 3.018432$

2c. $\$325 \times 2.046125$

2d. $\$105 \times 8.07035$

2e. $\$52 \times 5.00875$

2f. $\$279 \times 4.12265$

3 **Subtract** money amounts.
Find the difference. $\$840.27 - \$662.32 = \$177.95$

3a. $\$2{,}843.67 - \$1{,}909.14$

3b. $\$526.01 - \$493.64$

3c. $\$759.45 - \$602.89$

3d. $\$2{,}005.75 - \$1{,}945.36$

Annuities

An **annuity** is a series of equal payments made at regular intervals of time. Rent, salaries, and loan payments are all examples of annuities. Making regular deposits into a savings account is also an annuity.

An annuity is called an *annuity due* when payments are made at the beginning of each period. An annuity is called an *ordinary annuity* when the payments are made at the end of each period.

In this text, the focus will be ordinary annuities, although with the appropriate tables, the calculations for an annuity due are the same as an ordinary annuity.

Future Value of an Ordinary Annuity

The **future value of an annuity** is the amount of money in an account after a series of equal payments are made to it, including interest the money has earned.

One way to find the future value of an annuity is to use an annuity table. Use the multiplier that corresponds to the interest rate per period and the number of periods of compounding.

Future Value of Ordinary Annuity										
	Rate Per Period									
Periods	0.25%	0.50%	0.75%	1%	1.50%	2%	2.50%	3%	4%	5%
8	8.07035	8.14141	8.21318	8.28567	8.43284	8.58297	8.73612	8.89234	9.21423	9.54911
10	10.11325	10.22803	10.34434	10.46221	10.70272	10.94972	11.20338	11.46388	12.00611	12.57789
12	12.16638	12.33556	12.50759	12.68250	13.04121	13.41209	13.79555	14.19203	15.02581	15.91713
16	16.30353	16.61423	16.93228	17.25786	17.93237	18.63929	19.38022	20.15688	21.8253	23.65749
20	20.48220	20.97912	21.49122	22.01900	23.12367	24.29737	25.54466	26.87037	29.77808	33.06595
24	24.70282	25.43196	26.18847	26.97346	28.63352	30.42186	32.34904	34.42647	39.08260	44.50200
30	31.11331	32.28002	33.5290	34.78489	37.53868	40.56808	43.90270	47.57542	56.08494	66.43885
40	42.01320	44.15885	46.44648	48.88637	54.26789	60.40198	67.40255	75.40126	95.02552	120.7998

EXAMPLE 1

Tan decides to put $100 each quarter into an account earning 4% interest compounded quarterly. How much will be in the account after 5 years? How much of that money will be interest?

SOLUTION

$4\% \div 4 = 1\%$ interest rate per period

4 quarters $\times$ 5 years = 20 periods number of periods

Find the multiplier in the Future Value table: 22.01900

$\$100 \times 22.01900 = \$2{,}201.90$ amount in the account after 5 years

$\$100 \times 20 = \$2{,}000$ amount Tan deposited in 5 years

$\$2{,}201.90 - \$2{,}000 = \$201.90$ amount of interest

Tan will have $2,201.90 in the account after 5 years. He will earn $201.90 in interest.

✔CHECK YOUR UNDERSTANDING

A. Janet Powers saves $75 per month and deposits the money in an account earning 3% annual interest compounded monthly. How much will be in the account after 2 years? How much of that money is interest?

B. Liberty Hodges saves $150 per quarter and deposits the money in an account earning 6% interest compounded quarterly. What is the future value of the annuity after 5 years? How much of that money is interest?

Present Value of an Ordinary Annuity

The **present value of an ordinary annuity** is the balance needed in an account in order to make a series of payments from the account. While the account is being reduced by the payments, interest is still earned on the money that is in the account. In calculating the future value of an ordinary annuity, the payments are coming from the account at the end of the period.

To find the present value of an annuity, use the Present Value of an Ordinary Annuity table in the same way that you used Future Value of an Ordinary Annuity table.

Present Value of Ordinary Annuity										
	Rate Per Period									
Periods	0.25%	0.50%	0.75%	1%	1.50%	2%	3%	4%	5%	6%
4	3.97512	3.95050	3.92611	3.90197	3.85438	3.80773	3.71710	3.62990	3.54595	3.46511
5	4.96272	4.92587	4.88944	4.85343	4.78264	4.71346	4.57971	4.45182	4.32948	4.21236
10	9.86386	9.73041	9.59958	9.47130	9.22218	8.98259	8.53020	8.11090	7.72173	7.36009
12	11.80725	11.61893	11.43491	11.25508	10.90751	10.57534	9.95400	9.38507	8.86325	8.38384
14	13.74096	13.48871	13.24302	13.00370	12.54338	12.10625	11.29607	10.56312	9.89864	9.29498
16	15.66504	15.33993	15.02431	14.71787	14.13126	13.57771	12.56110	11.65230	10.83777	10.10590
24	23.26598	22.56287	21.88915	21.24339	20.03041	18.91393	16.93554	15.24696	13.79864	12.55036
30	28.86787	27.79405	26.77508	25.80771	24.01584	22.39646	19.60044	17.29203	15.37245	13.76483

EXAMPLE 2

Rey Garza wants to receive an annuity payment of $200 for each quarter for the four years he will be in college. If his account earns 6% interest, how much money must be in the account by the time he starts college? How much of what he receives will be interest?

SOLUTION

6% ÷ 4 = 1.5% interest rate per period

4 quarters × 4 years = 16 periods number of periods

Find the multiplier in the Present Value table: 14.13126

$200 × 14.13126 = $2,826.25 balance needed

$200 × 16 = $3,200 amount of money received

$3,200 − $2,826.25 = $373.75 amount of interest

Rey needs $2,826.25 in the account. He will receive $373.75 in interest.

✔CHECK YOUR UNDERSTANDING

C. What amount must you invest today at 6% compounded annually so that you can withdraw $5,000 at the end of each year for the next 5 years? How much will you withdraw in interest?

D. Mara Wilmouth wants to take a year off working to travel. She estimates that she will need $2,000 at the end of each month to pay for the following month's expenses. How much will she need to have in an account that pays 3% interest compounded monthly?

Wrap Up ▶ ▶ ▶

Manuel and Germaine Montez deposit $50 a month for 18 years in an account earning 5% interest compounded monthly. You can use an online ordinary annuity calculator, or you can use the multiplier 349.20202 to calculate the future value. The account will have about $17,460 after 18 years.

Exercises

Find the quotient.

1. 3 ÷ 12

2. 6 ÷ 12

Find the product.

3. $621.92 × 1.349623

4. $3,500 × 2.36589

5. $400 × 0.99634

6. $2,000 × 1.03987

Find the difference.

7. $733.29 − $548.23

8. $55,296.10 − $36,823.90

9. $1,835 − $1,254.59

10. $852.44 − $729.39

Solve each problem.

Find the future value and the amount of interest for each ordinary annuity.

	Amount Deposited	Frequency	Rate	Time	Future Value	Amount of Interest
11.	$250	Quarterly	4%	4 years		
12.	$2,000	Annually	2.5%	10 years		
13.	$25	Monthly	6%	1 year		
14.	$500	Semiannually	3%	15 years		
15.	$75	Monthly	3%	2 years		

Find the present value and the amount of interest received for each ordinary annuity.

	Amount Received	Frequency	Rate	Time	Present Value	Amount of Interest
16.	$1,500	Quarterly	8%	1 year		
17.	$400	Annually	4%	5 years		
18.	$200	Monthly	6%	2 years		
19.	$5,000	Semiannually	2%	7 years		
20.	$75	Quarterly	3%	3 years		

Chad Holley saves $500 per quarter. He deposits it in an account that earns 4% compounded quarterly.

21. How much will he have in the account after 2 years?
22. How much will he have in the account after 4 years?
23. How much will he have in the account after 10 years?
24. After 10 years, how much interest will he have earned?

Aly Daniels wants to receive an annuity payment of $250 per month for 2 years. Her account earns 6% interest, compounded monthly.

25. How much should be in the account when she wants to start withdrawing?
26. How much will she receive in payments from the annuity?
27. How much of those payments will be interest?

Rachale Martinez is in high school and is saving to buy a car. She estimates that she will spend $5,000 on her car when she graduates high school. For the four years of high school, she plans to save $225 a quarter on an account that earns 4% annually, compounded quarterly.

28. How much will she have after 4 years?
29. How much of the balance after 4 years will be interest?
30. How much more money will she need at the end of the 4 years to buy a car?

31. **STRETCHING YOUR SKILLS** Janell deposits $2,000 and for 5 years leaves it in an account earning 3% annual interest, compounded quarterly. For 5 years, José saves and deposits $150 per quarter in an account earning 3% interest compounded quarterly. Who will have more money in the account after 5 years? How much more?

Mixed Review

32. 15% of $85
33. $485.23 − $16.82
34. John earns 5% commission on sales up to $15,000 and 7% commission on sales over $15,000. If he has $35,000 in sales last month, what was his commission?

Chapter Review

Vocabulary Review

Find the term, from the list at the right, that completes each sentence. Use each term only once.

1. A series of regular deposits into or payments from an account is called (a, an) ___?___.
2. The amount of money in a checking account is called the ___?___.
3. The total in a savings account at the end of a period after interest is added is called the ___?___.
4. A printed report of bank transactions given to a depositor is called (a, an) ___?___.
5. A savings plan also known as a time deposit or savings certificate is called (a, an) ___?___.
6. A record you keep of deposits made and checks written is called (a, an) ___?___.
7. The movement of money from one bank's computer to another computer is called ___?___.
8. The fixed period of time money is on deposit in a savings certificate is called the ___?___.

- annuity
- Automated Teller Machine, (ATM)
- balance
- bank statement
- certificate of deposit (CD)
- check register
- compound amount
- compound interest
- debit card
- deposit slip
- direct deposit
- Electronic Funds Transfer, (EFT)
- future value of an annuity
- interest
- maturity date
- online banking
- outstanding checks
- overdrawn
- present value of an annuity
- reconcile
- service charge
- term
- transaction

3-1 Saving Accounts

9. Bob Rowinski made a $4,000 deposit to a savings account paying 1.6% annual interest compounded semiannually. If he kept the money on deposit for 6 months, what would his account balance be after the interest payment is made?
10. On April 1, Preston McCord deposited $1,400 in a savings account that pays annual interest of 3.2% compounded quarterly. If he made no deposits or withdrawals in the account, what interest could he earn by keeping his money on deposit until October 1?
11. Joanna Michael deposits $3,500 in a savings account that earns 2% compounded daily. If no deposits or withdrawals are made, how much will be in the account after 5 years?

3-2 Checking Accounts

12. Justin Nucci listed these items on his deposit slip: (bills) 8 one-hundreds, 27 fifties, 83 fives, 141 ones; (coins) 13 quarters, 117 nickels; (checks) $317.94, $57.89, $527.24 and $77.49. He received cash back of 30 twenties and 11 tens. What total deposit did he make?

13. Zora Omar had a balance of $1,189.17 in her checking account. She wrote checks for $62.41, $224.14, $12.92, and $357.16. Her deposits were $197.34 and $879.13. What was Zora's new bank balance?

3-3 Electronic Banking

14. At the start of the day, Grace Williams' checking account had a $201.87 balance. She used her debit card to pay $56.12 for groceries and $28.45 for cleaning. Grace then transferred $150 to her checking account from savings using her bank's ATM. She also directed her bank to transfer funds electronically from her checking account to pay a charge account bill of $187.12. What was the balance of Grace's checking account at the end of the day?

15. Basil Tomlin's online checking account had a balance of $371.07. The balance did not include a direct deposit of $672.80 that will be transferred to the checking account by Basil's employer at 11:00 a.m. Basil's bank will automatically deduct a house payment of $720 at the end of the business day. Basil plans to make online payments for $34.85, $90.29, and $368.20. How much money does Basil need to transfer to complete these transactions and still have a balance of $100?

3-4 Check Register Reconciliation

16. Giselle Mulroon's bank statement shows a balance of $539.22. Checks outstanding were #841 for $29.67, #843 for $89.02, and #844 for $9.76. A $130 deposit was outstanding. Reconcile Giselle's bank statement.

17. Henry Sokol's bank statement balance on June 30 was $845.43. His check register balance was $247.62. His comparison of the two records showed a check for $85 was recorded twice in the register, a check for $138.11 was recorded as $183.11, and an ATM deposit of $368 and a debit card purchase for $81.10 were not recorded in the register. Also, an ATM withdrawal of $50 and interest earned of $0.82 were not recorded. Three checks were outstanding: $191.22; $23.87; and $15. Reconcile Henry's bank statement and check register.

3-5 Money Market and CD Accounts

18. Sonya Lister's 6-month CD pays 5.3% simple interest. Her deposit to the CD was $4,500. At the end of each 6-month period, Sonya withdraws the interest earned and renews the CD on its original terms. What total interest will Sonya have earned at the end of one year?

19. Dale Lawrence had $80,000 on deposit in a six-month CD paying 2.72% simple interest. At the end of three months, Dale cashed out the CD. The penalty for early withdrawal of money from this CD is one-month's interest. What was the amount of the penalty Dale had to pay?

3-6 Annuities

20. José is planning to save $65 a month for 2 years. The money will earn 3% interest compounded monthly. How much will be in the account at the end of 2 years? How much of that money will be interest?

21. Albert wants to receive a $4,000 annuity payment each year for 10 years. If he will earn 5% interest compounded annually, how much does he need in the account when he starts the withdrawals?

Technology Workshop

Task 1 Comparing the Interest Earned on Savings Accounts

Enter data into a template that calculates the compound interest earned by two savings deposits. Use the results to compare the interest earned by different savings plans.

Open the spreadsheet for Chapter 3 (tech3-1.xls) and enter the data shown in blue (cells B4-7 and C4-7) into the spreadsheet. The compound amount and compound interest of two savings deposits will be calculated and also the difference in the amount of interest earned by the deposits. Your computer screen should look like the one shown below when you are done.

	A	B	C	D
1	**COMPARING INTEREST EARNED IN SAVINGS ACCOUNTS**			
2				
3	**ACCOUNT INFORMATION:**	**ACCOUNT A**	**ACCOUNT B**	**DIFFERENCE**
4	Interest Rate (%)	4.00	4.00	
5	Interest Periods in a Year	12	4	
6	No. of Periods on Deposit	12	4	
7	Amount of Deposit	$1,500.00	$1,500.00	
8	**INTEREST INFORMATION:**			
9	Compound Amount	$1, 561.11	$1,560.91	
10	Less Original Deposit	$1,500.00	$1,500.00	
11	Interest Earned	$61.11	$60.91	
12	**DIFFERENCE: (ACCOUNT A – ACCOUNT B)**			**$0.20**

Task 2 Analyze the Spreadsheet Output

Answer these questions about the interest calculations.

1. What number of years was the money on deposit in both accounts?
2. How much money was on deposit in both accounts?
3. What compounding period was used to compute interest in Account A?
4. What was the total interest earned by the deposit in Account B?
5. Which account earned the most interest, and how much more did it earn?

Now move the cursor to cell C4, which holds the Account B interest rate. Enter a new interest rate of 4.1% without the percent symbol.

6. What is the new difference between Account A and Account B?
7. What does it mean when a number is enclosed in parentheses?
8. If the result in Cell D12 shows a negative number, is there something wrong with the result?

Now use the spreadsheet to calculate the answers to interest problems you have already solved or to compare the terms of savings plans.

Task 3 Design a Bank Reconciliation Spreadsheet

You are to design a spreadsheet that will reconcile the bank statement balance and the check register balance.

The spreadsheet for Task 3 may be solved by using addition and subtraction. The spreadsheet should have two sections, placed side-by-side, one for the bank statement and the other for the check register.

Place all the items to be added or subtracted in one column with the balance labeled at the bottom. You may want to indicate that a number is to be subtracted by placing a minus sign before the number when it is entered, but do so sparingly.

The information shown below lists the usual adjustments necessary to complete the reconciliation of the bank statement and check register. Add any other adjustment items you think are necessary. Be sure to allow enough lines so that all data may be entered.

SITUATION: Your bank statement and check register balances do not agree. The following shows what was found when the bank statement and check register were compared. Prepare a spreadsheet that will result in both the bank statement and check register balances being in agreement.

Bank Statement		Check Register		
Closing Balance	$498.36	Last Balance	$483.41	
Late Deposit	$0.00	Deposit Outstanding	$0.00	
Outstanding Check	$75.30	Other Credit	$20.00	
Outstanding Check	$32.57	Interest Earned	$0.56	
		Check, Debit, or ATM withdrawal		$91.28
		Check, Debit, or ATM withdrawal		$15.00
		Check Error		*
		Service Charge		$4.50
		Other Charge		$2.25

*Check #764 for $17.50 was recorded incorrectly in the check register as $17.05.

Task 4 Analyze the Spreadsheet Output

Answer these questions about your completed spreadsheet:

9. What was the reconciled balance?

10. Why are outstanding checks deducted from the bank statement balance?

11. How was the error made on Check #764 corrected?

12. In what other way could you have corrected the Check #764 error?

Continue testing the spreadsheet by entering the data from reconciliation problems you have already solved.

Chapter Assessment

Chapter Test

Answer each question.

1. $237.10 + $76 + $0.56 + $2.48
2. $745.28 − $237.30
3. $850 × 0.00368
4. 6.7% × $\frac{1}{4}$
5. $268.44 × $\frac{1}{12}$
6. 2.37% × $1,200
7. $2\frac{3}{8} - 1\frac{1}{2}$
8. 54 is what percent of 360?
9. 350 increased by $\frac{1}{5}$ of itself is?
10. $288 is $\frac{6}{5}$ of what number

Solve.

11. Stuart Terril listed these items on his checking account deposit slip: (bills) 47 ones, 3 fives; (coins) 129 quarters, 74 dimes; one check for $8. His cash received consisted of 2 twenties and 1 ten. In addition, two other deposits for $200 and $110 were made. A check was written for $650. If the starting balance was $8,411.13, what was the balance after the three deposits and 1 check?
12. On Friday, Carlotta Rowe's checking account balance was $173.56. During the day Carlotta's employer deposited her $516.45 pay directly to her checking account. At lunchtime, she wrote checks for $172, $86.43, and $9.05, and made an ATM withdrawal from checking of $150. What is the balance of Carlotta's checking account at the end of the day?
13. The bank statement sent to Abigail Ochs did not show checks for $158.23, $12.89, and $71.27, and an outstanding deposit of $75 that were listed in the check register. The balance printed on the statement was $289.07. What is the reconciled bank statement balance?
14. The bank statement of Jake Hansen showed a balance of $356.93. His check register showed a balance of $308.34. When Jake compared the two records he found several differences. The bank statement listed these items not recorded in the register: ATM withdrawal, $50; ATM fee, $2.25; direct deposit of paycheck, $624.70; checks for $287.23, $180.11, and $72.89. A check for $85.89 was recorded in the register as $58.89. The items not listed on the bank statement included checks for $72.44, $9.76, and $113.57; and a $50 deposit made after the statement closing date. Debit card purchases of $85.67 and $16.73 appeared on the statement but not in the register. Reconcile Jake's bank statement and check register.
15. Find the interest that a $510 deposit will earn in 3 months at 4.25% simple interest.
16. The daily interest multiplier for a savings account paying 2% annual interest for 180 days is 1.010050. What compound amount will be in a savings account if $5,000 is on deposit in the savings account for 180 days?
17. A 2-month CD pays 2.1% simple interest for the term of the deposit. A savings account pays 1.65% annual interest compounded monthly. In which account will a $3,600 investment earn the most interest for two months, and how much more?
18. What is the future value of $500 invested quarterly at 4% interest compounded quarterly for 5 years?

Planning a Career in Arts, A/V Technology, and Communications

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There are a wide variety of career choices available in the arts, A/V technology, and communications industries. If you earn a living in the arts, you may find yourself acting on a stage, creating visual arts, or writing songs or music. In the A/V or audio and video technology area, you might choose a career in motion pictures, television, or the video industry. Opportunities in communications exist in journalism, broadcasting, and telecommunications. If you are creative, communicate well, or have musical or artistic talent, a good career choice may be in the arts, A/V technology, and communications industries. Consider your talents and skills, as well as your interest.

Job Titles

- Playwright
- Camera operator
- Graphic designer
- Electric engineer
- Entertainer
- Desktop publisher
- Artist
- Sound technician
- Journalist
- Song Writer

Needed Skills

- natural talent for performing or visual arts
- strong creative writing ability
- computer and technology skills
- good eye for details
- ability to work independently
- able to perform well under pressure

What's it like to work in Photojournalism?

A photojournalist takes pictures of newsworthy events, featured subjects, and people for newspapers, magazines, and television. A photojournalist spends time at the computer editing his or her work. In television, a photojournalist works with a crew that includes a news reporter and sound technician, plus other behind-the-scenes members of a news team. In the printed media, a photojournalist is likely to work independently, receiving assignments and submitting his or her work to an editorial supervisor for publication.

What About You?

What aspect of the fields of arts and communication appeals to you?

How Times Have Changed

For Questions 1-4, refer to the timeline on page 79 as needed. Round answers to the nearest percent.

1. What was the percent increase of ATMs from 1973 to 1990?
2. What was the percent increase of ATMs from 1973 to 2004?
3. What was the percent increase of ATMs from 1990 to 2004?
4. What was the percent decrease of ATMs from 2004 to 2007?

Chapter 4

Credit Cards

Statistical Insights

Percent of Families Holding Specific Debt	
By Age of Head of Family	
Age of Head of Family	**Credit Card Balance**
Under 35 years old	50.7%
35–44 years old	51.3%
45–54 years old	52.5%
55–64 years old	45.7%
65–74 years old	29.2%
75 years old and older	11.2%
By Family Income	
Family Income	**Credit Card Balance**
Less than $10,000	20.6%
$10,000–$24,999	37.9%
$25,000–$49,999	49.9%
$50,000–$99,999	56.7%
$100,000 or more	40.4%

Use the data shown above to answer each question.

1. Using the *By Family Income* data, rank the income levels in order from the group with the greatest percent to the least percent of credit card debt.
2. Which age group is most likely to have a credit card balance?

How Times Have Changed

Credit was used in ancient civilizations more than 3,000 years ago. Ever since then, merchants have been introducing new ways for customers to pay with credit. Some have used the honor system and others have used informal tally systems. In the 19th century, stores issued aluminum charge plates or celluloid charge coins. The term *credit* comes from the Latin word meaning *trust*.

1950

1950 Diners Club introduced the first credit card.

1958 The Bank of America issues BankAmericard, known today as Visa.

1960

1966 The Interbank Card Association (ICA) issues the MasterCharge card, known today as MasterCard.

1970

1974 Magnetic strips are first introduced on credit cards.

1980

1986 The Discover Card is introduced.

1987 American Express allows consumers to pay their balances over time.

1990 Supermarkets begin accepting credit cards.

1990

1996

Research to find a significant event in 1996 that relates to the late penalty fees that credit card companies can charge.

2000

2001 Nearly $\frac{3}{4}$ of all families have at least one credit card.

2010

2007 American consumers carry $937 billion dollars in credit card debt.

NET Bookmark

The Federal Trade Commission has a micro site that provides information about credit and credit cards. Access **www.cengage.com/school/business/businessmath** and click on the link for Chapter 4. How much would the monthly payment be to pay off $500 of credit card debt at 18% interest for 24 months using a card without an annual fee? How much will the credit cost?

4-1

Credit Card Costs

GOALS

- Identify important information about credit card terms and conditions
- Calculate the new balance on a credit card
- Verify transactions on credit card statements
- Calculate the cost of using a credit card

KEY TERMS

- periodic finance charges
- credit terms and conditions
- annual percentage rate (APR)
- grace period

Start Up ▶▶▶

When Robert receives his credit card statement each month, he simply mails a check for his payment. He decided the time it takes to verify the charges was not worth it. His feeling is that a computer prints out the statement so there will be no errors. What are the dangers in using a credit card as Robert does?

Photodisc/Getty Images

Math Skill Builder

Review these math skills and solve the exercises that follow.

1. **Divide** money amounts and decimals by whole numbers.
Find the quotients. $\$366 \div 30 = \$12.20$ $\$18.25 \div 365 = \$0.05$

1a. $\$44.95 \div 31$ **1b.** $\$24 \div 12$ **1c.** $921.25 \div 55$

2. **Multiply** money amounts by percent.
Find the product. $\$500 \times 5.5\% = \$500 \times 0.055 = \$27.50$

2a. $\$150 \times 20\%$ **2b.** $\$868 \times 4\%$

2c. $\$650 \times 2.8\%$ **2d.** $\$1{,}200 \times 6.5\%$

3. **Add** and **subtract** money amounts.
Find the sum or difference. $\$3.45 + \$25 = \$28.45$; $\$3{,}298 - \$725 = \$2{,}573$

3a. $\$52.19 + \$78.42 + \$1.89$

3b. $\$189 + \$92.09 + \$3.87$

3c. $\$4{,}098.34 - \$871.36$

3d. $\$1{,}830.43 - \$792.19$

4. **Rewrite** percents as decimals.
Rewrite 45.6% as a decimal. 0.456

4a. 89.08% **4b.** 0.736% **4c.** 0.0287%

Using a Credit Card

In a credit card transaction, the issuer of the credit card lends money to the credit card user. That money is paid to a retail merchant on behalf of the credit card user. By signing the merchant's sales slip, the credit card user agrees to pay that money back to the credit card company.

Each month, the credit card company provides a statement to the credit card user that details the purchases, fees, payments and other credits, and the total amount owed.

The total amount may include interest or **periodic finance charges**, as well as other fees. The credit card user makes a payment by a due date for at least the minimum amount given on the statement.

Before applying for a credit card, consumers should read the **credit terms and conditions**. The credit terms and conditions outline the costs associated with using the credit card, and can vary widely among companies that issue credit cards. By law, all credit card solicitations and applications must provide a disclosure box with certain key information.

A sample disclosure box is shown.

Annual percentage rate (APR) for new purchases	2.9% until 11/1/—, after that **14.9%**
Other APRs	Cash advance APR: 15.9%
	Balance transfer APR: 15.9%
	Penalty rate: 23.9% See explanation below.*
Variable-rate information	Your APR for purchase transactions may vary. The rate is determined monthly by adding 5.9% to the Prime Rate.**
Grace period for repayment of balances for purchases	25 days on average
Method of computing the balance for purchases	Average daily balance (excluding new purchases)
Annual fees	$50
Minimum finance charge	$0.50
Transaction fee for cash advances: 3% of the amount received	
Balance transfer fee: 3% of the amount transferred	
Late payment fee: $25	
Over-the-credit-limit fee: $25	
*Explanation of penalty: If your payment arrives more than ten days late two times within a six-month period, the penalty rate will apply.	
**The Prime Rate used to determine your APR is the rate published in the *Wall Street Journal* on the 10th day of the prior month.	

The **annual percentage rate (APR)** is the rate of interest that is charged on a balance that is carried over past the due date, a cash advance, or a balance transfer from another credit card. The APR for cash advances and balance transfers is typically higher than the rate for purchases.

A **grace period** allows you to avoid all finance charges if you pay your balance in full by the due date. Grace periods usually do not apply to cash advances and balance transfers. If you did not pay your balance in full the previous month, you lose your grace period for the next month and finance charges will begin to accrue beginning the date of any new purchases.

There are several accepted methods for computing the balance on purchases. It is this balance that is the amount used to calculate the finance charges. A credit card company may use the average daily balance method (including or excluding new purchases), the adjusted balance method, or the previous balance method. Whichever method is used, most companies have a minimum finance charge.

Credit card companies may charge other fees including annual fees, cash advance and balance transfer fees, late payment fees, and over-the-credit-limit fees. Such fees must be explained in the disclosure box issued by the credit card company.

EXAMPLE 1

Chad Eubanks is applying for the credit card with the terms and conditions in the disclosure box shown on the previous page. After receiving the card, he plans to transfer $2,000 from another credit card because his new card has a lower APR. What fee will he pay to transfer the balance?

NET Bookmark

Search the Internet to find different types of credit cards such as secured credit cards and prepaid credit cards. Compare and contrast these types of credit cards with a traditional credit card.

SOLUTION

The balance transfer fee is 3% of the amount transferred.

$\$2{,}000 \times 0.03 = \$60$

The balance transfer fee is $60.

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✔ CHECK YOUR UNDERSTANDING

A. After Chad received his card, the Prime Rate is published at 9.3%. What is the new APR on purchases? Did the APR increase or decrease?

B. After Chad had been using the credit card for 6 months, he made his second late payment. He received notification that his balance would be subject to the penalty rate. What is his new APR?

Information on a Credit Card Statement

Midori Masami's credit card statement is shown on the next page. Find each italicized word below on the statement:

Transactions are events that need to be recorded on the statement. These events include *purchases, payments* made, and any *fees* Midori has been charged or *credits* made to her account.

Notice that although Midori purchased some clothes on 2/1 from Gale's Fashions, the card company did not record, or *post* the sale to the statement until 2/3.

Midori's *previous balance* from her last statement was $316.15. On 2/25, Midori's payment for her previous balance was received.

The card company allows Midori to carry a maximum balance of $5,000. If she spends more than that *credit limit,* the company will charge her an over-the-credit-limit fee.

OneBank Card

Acct. No. 1200 1200 0000 1200
Statement Closing Date: 02/28/--
Credit Limit: $5,000.00

For customer service call: 1-800-555-5600
Cash Advance Limit: $1,500.00
Payment Must Be Received By: 03/25/--

Trans-action Date	Post Date	Reference	Transaction Description		Payments & Credits	Loans, Fees, & Purchases
2/1	2/3	T970R194	Gale's Fashions	Peoria, IL		139.89
2/5	2/7	297B9875	Superfast Gas	Peoria, IL		15.68
2/10	2/12	N978T125	Pasta Garden Restaurant	Peoria, IL		18.25
2/15	2/16	M5980922	Gale's Fashions-Return	Peoria, IL	15.99	
2/17	2/18	9780H142	Boulevard Music Store	Springfield, IL		11.31
2/20	2/20	91089478	Annual membership fee			25.00
2/25	2/25	41978573	Payment Thank You		316.15	

Previous Balance	Purchases & Fees	Payments & Credits	Finance Charge	New Balance	Minimum Payment Due On Due Date	APR 18.9% Monthly Periodic Rate
316.15	210.13	332.14	0.00	[redacted]	5.82	1.575%

On 2/15, a *credit* occurred when Midori *returned* part of the clothes she had bought from Gale's Fashions. Credits, like payments, are amounts that are subtracted from Midori's card balance.

The statement shows that Midori can borrow up to $1,500 from the company on a *cash advance.* Midori did not take any cash advances during February.

Midori paid no *finance charges* on the previous month's balance. That's because she paid her balance in full during the grace period.

The *statement closing date* is the last date on which transactions are posted to the statement. That date is 2/28 for Midori.

OneBank's finance charge rate is shown in the bottom right corner of the statement. The *annual percentage rate* is 18.9%. The *monthly periodic rate* is the annual percentage rate divided by 12, or 1.575%.

Midori's *new balance* can be found by taking the previous balance, adding purchases and fees plus finance charges, and subtracting payments and credits.

New Balance = Previous Balance + (Purchases + Fees + Finance Charges) − (Payments + Credits)

The *minimum payment due* that Midori must make to the card company is $5.82. Since she doesn't want to pay a finance charge, she plans to pay the new balance in full by the due date, 3/25.

EXAMPLE 2

Midori Masami received the statement shown on the previous page. What is her new balance?

SOLUTION

Use the formula for the new balance.

New Balance = $316.15 + ($210.13 + $0.00) − $332.14 = $194.14

✔CHECK YOUR UNDERSTANDING

C. Enrique Cruz's previous balance on his credit card was $0. He made $25 in purchases, and was charged an annual fee of $75. What should his new balance be?

D. Bev Donnigan's previous credit card balance was $122.36. She charged $114 in new purchases, made a payment of $122.36, and was charged no finance charges. What is her new balance?

Business *Tip*

If your credit card is used by someone else illegally, you can be held responsible for up to $50 per card. If your card is lost or stolen and you notify the card company before any purchases are made, you are not liable for any unauthorized purchases. If someone has stolen your credit card number and not the card, you are not liable for any unauthorized purchases.

Making Payments

Many credit card companies make customers' credit card statements and a record of current transactions available online. This allows customers 24-hour access to account activity. Many people check their account online regularly to check for *unauthorized charges*, which are charges that are on their account but that they didn't make.

Unauthorized charges can happen when a mistake is made or if someone has used your credit card or credit card number illegally.

Credit card users should keep sales receipts for credit card purchases to verify account activity. If any errors are found in a credit card statement or online record of transactions, a customer should contact the credit card company immediately.

Credit card payments can often be made by check or by an online payment from a bank account. If paying by check, you should leave plenty of time for the check to be received before the due date. Any online payments should be scheduled to be transacted on or before the due date.

Sales Receipt

Gale's Fashions, Inc.
2678 Furth St., Peoria, IL 61612
(309) 555-2525
THANK YOU

MERCHANT ID: 346184688345854
One Bank Card Sale/Swiped
Acct: **********1200 Exp: 10/12
Midori Masami

Amount $ 139.89

X *Midori Masami*
Midori Masami

Date: 02/01/-- Day: WED Time: 14:36
Authorized ticket: 564638

TOP COPY-MERCHANT
BOTTOM COPY-CUSTOMER

EXAMPLE 3

Midori compared her sales slips with the statement transactions. She found sales slips for 2/1, 2/5, 2/10, and 2/15 and noted that the amounts were correct. She didn't find a sales slip for the 2/17 transaction and knew she did not buy anything in Springfield during February. The 2/28 payment listed agreed with her checkbook register and she knew that her check was sent late. She also verified that her membership fee was due. What is Midori's correct new balance?

SOLUTION

Subtract the unauthorized purchase from the new balance on the statement.

$194.14 − $11.31 = $182.83 corrected new balance

✔ CHECK YOUR UNDERSTANDING

E. When Vondel Bradshaw checked his credit card statement, he found that a sales slip dated 3/2 for $12.49 was posted as $12.99. He also found that a purchase for $56.29 dated 2/19 was unauthorized. If the new balance on the statement was $491.23, what is the correct new balance?

F. Sonja Erickson checked her credit card statement and found a sales slip for $48.99 that was unauthorized. She also found that a sales slip for $17.89 had been listed as $18.79. If the new balance shown on her statement was $208.66, what is her correct new balance?

Cost of Credit Card Use

The finance charges and fees you pay on your credit card can add up. You should calculate the total cost of your credit card to see if using one is of value to you and to compare the cost of your current card to other cards.

EXAMPLE 4

Danny O'Hare switched from the Clarion credit card to the First Bank credit card in April. When he did, he paid an annual membership fee of $50. He also paid a balance transfer fee of 2% of his old card's $420 balance. During the next 12 months, he paid an average monthly finance charge of $33.80 on his unpaid balance. What was Danny's total cost for using his credit card for the year?

SOLUTION

Multiply the monthly finance charge by 12 months.

12 × $33.80 = $405.60 total finance charge for year

Multiply the Clarion card balance by the balance transfer fee rate.

$420 × 0.02 = $8.40 balance transfer fee

Add the total finance charge, balance transfer fee, and membership fee.

$405.60 + $8.40 + $50 = $464 total cost of credit card for year

Business *Tip*

Stores are charged a fee by the credit card company for accepting credit card purchases. The fee may range between 1.5%–6% of the sale. The store may also be charged a fee for every credit card transaction.

✔ CHECK YOUR UNDERSTANDING

G. Lili Favre opened a SkyMail credit card in January. She paid a membership fee of $45 and a balance transfer fee of $29 when she moved the balance of her old card to her SkyMail card. During the year, she paid these finance charges: January $2.68; February $7.28; June, $9.22; October $3.98. What was the total annual cost of the card to Lili?

H. Derwood Kant's credit card statement for May showed a membership fee of $25, a late fee of $29, a finance charge of $3.15, and an over-the-limit fee of $16. What was the total cost of the card to Derwood in May?

Wrap Up ▶ ▶ ▶

Robert may be paying for charges he did not make or fees he should not have to pay. Even though a computer does print the statements, unauthorized use of a credit card does occur. Robert should always check his statements.

Financial Responsibility

Debit cards that carry a credit card logo can be used in two ways. When the card is swiped and a PIN number is requested, the card is being used as a debit card. When the card is swiped and a signature is requested, the card is being processed as a credit card payment. These two types of transactions are processed differently by the bank. If a debit card is used like a credit card, the bank receives fees from the merchant for processing the card.

At many merchants if you use a debit card with a PIN number, you are charged a fee similar to fees charged at ATM machines. When you use a debit card as a credit card, no fee is charged to you.

Exercises

Perform the indicated operation.

1. $660 ÷ 26	**2.** $38.41 + $93.26 + $9.52	**3.** $252 + $63.14 + $6.62
4. 48 ÷ 8	**5.** $478 × 30 × 0.000628	**6.** $350 × 15 × 0.000491
7. $1,060 ÷ 20	**8.** $2,617.84 − $491.53	**9.** $3,205.33 − $1,493.59

Rewrite as a decimal.

10. 9.17%

11. 0.0316%

Solve.

12. Lannie Ickerson checked her credit card statement and found a purchase for $27.79 that was unauthorized. She also found that a sales slip for $11.29 had been listed as $12.19. If the new balance shown on her statement was $107.09, what is her correct new balance?

13. John Rawlings credit card statement for June 30 showed a previous balance of $248.67 and new purchases of $59.89 on 6/10, $15 on 6/15, and $28.97 on 6/17. He made a payment of $248.67 on 6/27. What is John's new balance?

Use the credit card statement for Ana Guzman to answer Exercises 14–16.

UniBank Card

Acct. No. 0200 0200 0000 0200
Statement Closing Date: 11/30/--
Credit Limit: $3,500

Ana Guzman
123 Presidents Place
El Paso, Tx 79915

Trans-action Date	Post Date	Reference	Transaction Description		Payments & Credits	Loans, Fees, & Purchases
11/3	11/4	592k9781	Crestwood Gym	El Paso, TX		49.99
11/7	11/9	297B9875	Broadway Videos	El Paso, TX		12.79
11/10	11/12	N978T125	The Corner Gas Station	El Paso, TX		24.59
11/17	11/18	M5980922	Regal Department Store-Return	El Paso, TX	38.29	
11/21	11/23	91089478	Annual membership fee			45.00
11/24	11/24	41978573	Payment Thank You		100.00	
11/30	11/30	41827753	Balance from Transcredit Card			267.88
11/30	11/30	41827756	Balance transfer fee			29.00

For customer service call: 1-800-555-7800
Cash Advance Limit: $1,000.00
Payment Must Be Received By: 12/25/--

Previous Balance	Purchases & Fees	Payments & Credits	Finance Charge	New Balance	Minimum Payment Due On Due Date	APR 18.0% Monthly Periodic Rate 1.5%
249.25	429.25	138.29	3.74		10.88	

14. By what date must she make the minimum payment? What was the date and amount of her last payment? What is her credit limit?

15. How much finance charge does she owe? How much money did she transfer from the Transcredit card to her UniBank card? What fee did she pay for the balance transfer?

16. What should Ana Guzman's new balance be on her credit card?

Solve.

17. Sandra Beal opened a new credit card in January. She paid a membership fee of $15 and a balance transfer fee of 5% when she moved $823.46 from her old card to her new card. During the year, she paid these finance charges: February $3.56; May, $5.82; July, $4.92; and September $2.18. What was the total annual cost of the card to Sandra?

18. Rick Chandler's credit card statements for the year showed a membership fee of $75, two late fees of $25, and an average finance charge of $23.75 a month. What was the total annual cost of the card to Rick?

Solve.

19. Heng-che Pai's credit card statement for May showed a previous balance of $289.16, new purchases of $107.99, a membership fee of $35, a finance charge of $5.96, and a payment of $100. What is her new balance?

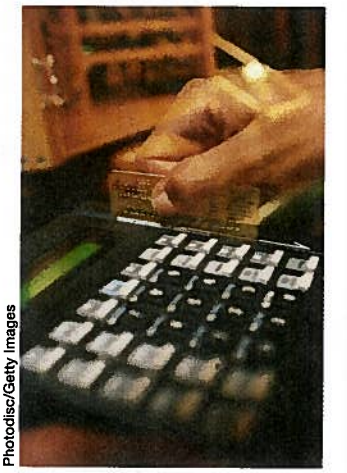
20. The credit card of Salizar Mendoza for April listed a previous balance of $419.65, new purchases of $283.15, a payment of $300, a finance charge of $7.23, and a late fee of $20. What is his new balance?

21. **STRETCHING YOUR SKILLS** BankNote Credit Card Company must pay a store $409,800 this month for sales the store's customers made using the BankNote credit card. Before paying, BankNote will deduct from the store's check a 3.5% merchant discount fee from the total sales. BankNote will also deduct a $0.20 transaction processing fee for each of the 21,283 BankNote credit card transactions made at the store during the month. What net amount will the store receive from BankNote?

22. **STRETCHING YOUR SKILLS** Roslynn Rheinhart bought a wood chipper priced at $575 and received a 4% discount for paying cash instead of using a credit card. What did Roslynn pay for the chipper?

23. **CRITICAL THINKING** Many credit card companies use incentives like offering you rewards or cash back for using their credit card. How can a credit card company afford to give away rewards or give money back?

24. **FINANCIAL DECISION MAKING** You are considering different credit card offers. One card has an APR of 12% on purchases and an annual fee of $25. The other card has an APR of 15% and no annual fee. Which card would you choose and why?



Photodisc/Getty Images

Mixed Review

25. Write $302\frac{1}{4}\%$ as a decimal.

26. $4.90 is what percent greater than $4.20?

27. What amount is $62\frac{1}{2}\%$ smaller than $88?

28. Gary Feliciano transferred a balance of $900 to a new credit card with a lower APR. He paid a 3% balance transfer fee. How much was the fee?

29. Carmen Dize used an ATM to deposit a check for $361.90 and to withdraw $250 in cash. If her starting bank balance was $739.18, what is her new balance?

30. On June 30, Tina Nader's check register balance was $452.88 and her bank statement balance was $697.55. Checks outstanding were 561, $39.28; 562, $121.31; and 564, $83.19. The statement showed earned interest of $0.89. Reconcile the check register and bank statement.

31. Ira Morganstein's tax return last year showed gross income of $56,312 and adjustments to income of $2,184. What was Ira's adjusted gross income last year?

4-2

Credit Card Finance Charges

GOALS

- Calculate finance charges using a daily or monthly periodic rate
- Calculate finance charges using previous balance method
- Calculate finance charges using adjusted balance method

KEY TERMS

- periodic rate
- previous balance method
- adjusted balance method

Start Up ▶ ▶ ▶

Holly Winter is comparing two credit card offers. The APR and the annual fees are the same on the two credit cards. What else should Holly consider to evaluate which card is best for her?

Purestock/Jupiter Images

Math Skill Builder

Review these math skills and solve the exercises that follow.

1. **Add** and **subtract** money amounts.
Find the sum. $209.34 + $345.12 + $16.54 − $516.89 − $28.76 = $25.35

1a. $507.22 + $397.28 − $44.20 − $579.93

1b. $183.02 + $97.38 − $88.73 − $38.99

2. **Multiply** money amounts by decimals.
Multiply: $62.58 × 0.0021 = $0.13

2a. $398.77 × 0.000673

2b. $220.81 × 0.01975

2c. $710.29 × 0.2978

2d. $1,297.55 × 0.008271

Monthly and Daily Periodic Rates

If you don't pay your card balance in full by the due date, you will be assessed a finance charge. You also will lose the *grace period* for new purchases. Finance charges will be charged on new purchases from the day they are made.

The finance charge rates on credit cards are advertised by the annual percentage rate (APR), but finance charges are calculated using a monthly or daily **periodic rate**. To find the monthly or daily periodic rate, divide the APR by 12 or 365 and round to the nearest ten-thousandth.

Business *Tip*

The monthly or daily finance charge rate on a credit card balance is often called the *periodic rate.* The month for which you are billed is often called the *billing period.*

Periodic Finance Charge = Balance Subject to Finance Charge × Periodic Rate × Number of Periods

EXAMPLE 1

Jacquelyn is charged a finance charge on a credit card balance of $500.00. Her card has an APR of 15%. What will her finance charge be if the company uses a monthly periodic rate? What will her finance charges for the month be if the company uses a daily periodic rate for a 31 day billing cycle?

Math *Tip*

If a monthly periodic rate is used, divide the APR by 12.

If a daily periodic rate is used, divide the APR by 365.

Round the periodic rate percent to the nearest ten-thousandth.

SOLUTION

Find the monthly and daily periodic rates, rounded to the nearest ten-thousandth.

$15\% \div 12 = 1.25\%$; $15\% \div 365 = 0.0411\%$

Rewrite the periodic rates as decimals.

$1.25\% = 0.0125$; $0.0411\% = 0.000411$

Use the finance charge formula for each rate.

Finance Charge = $\$500 \times 0.0125 \times 1 = \$6.25$ using monthly periodic rate

Finance Charge = $\$500 \times 0.000411 \times 31 = \$6.37$ using daily periodic rate

The finance charge with a monthly periodic rate is $6.25. The finance charge with a daily periodic rate is $6.37.

✔CHECK YOUR UNDERSTANDING

A. The balance of Sue Millis' credit card that is subject to finance charges is $221.68. Her card has an APR of 18% and uses a monthly periodic rate. What are her current month's finance charges?

B. Roland Plewka must pay finance charges on a balance of $1,587. The credit card has an APR of 21%, and uses a daily periodic rate. What will he be charged in finance charges for a 30 day billing cycle?

Previous Balance Method

The amount of the finance charge depends on your periodic rate and how the card company figures the balance subject to finance charges. This balance can be found by several methods.

Laura Solon's credit card statement is shown on the next page. The finance charge, new balance, and minimum payment due boxes in the statement are gray because these amounts will vary with the method used to find the balance on which the finance charge will be applied.

The **previous balance method** charges interest on the balance in the account on the last billing date of the previous month. Any payments, credits, or new purchases in the current month are not included in the previous balance. Use the formula below to find the new balance.

New Balance = Previous Balance + (Finance Charge + New Purchases + Fees) − (Payments + Credits)

Trans-action Date	Post Date	Reference	Transaction Description		Payments & Credits	Loans, Fees, & Purchases
10/3	10/4	3165813T	Cardinal Shoe Stores, Inc.	Detroit, MI		128.99
10/7	10/9	4381R211	Vorax Gas Stations, Inc.	Detroit, MI		21.89
10/10	10/12	4Y659762	The Pasta Barn, Inc.	Detroit, MI		27.79
10/17	10/18	4897W544	Cardinal Shoe Stores-Return	Detroit, MI	35.99	
10/18	10/19	81976534	Annual membership fee			35.00
10/24	10/24	94681322	Payment Thank You		75.00	

Previous Balance	Purchases & Fees	Payments & Credits	Finance Charge	New Balance	Minimum Payment Due On Due Date	APR 18.000%
225.60	213.67	110.99				

EXAMPLE 2

Laura Solon's card company uses the previous balance method and a monthly periodic rate to figure the finance charge. Find the finance charge for the month and the new balance.

SOLUTION

Find the monthly periodic rate and rewrite it as a decimal.

$18\% \div 12 = 1.5\%; 1.5\% = 0.015$

Finance Charge $= \$225.60 \times 0.015 \times 1 = \$3.384$, or $\$3.38$

Add to find the new balance.

$\$225.60 + \$3.38 + \$213.67 - \$110.99 = \$331.66$

Math *Tip*

If a monthly periodic rate is used, the number of periods is 1.

If a daily periodic rate is used, the number of periods is the number of days in the billing cycle.

✔ CHECK YOUR UNDERSTANDING

C. John Olden's credit card statement for April showed a previous balance of $309.20, new purchases and fees of $128.45, and payments and credits of $75. The card's annual percentage rate is 24%. What is John's finance charge for April and new balance using the previous balance method and a monthly periodic rate?

D. Sandra Minoro's credit card company uses the previous balance method to calculate finance charges. Its APR is 21% and a daily periodic rate, rounded to the nearest ten-thousandth of a percent, is used. Sandra's credit card statement for June showed a previous balance of $488.32, new purchases and fees of $264.89, and payments and credits of $300. What is Sandra's finance charge for the 30 days in June and her new balance?

Adjusted Balance Method

The **adjusted balance method** subtracts payments and credits during this month from the balance at the end of the previous month. Purchases and fees made during the current month are not included in the adjusted balance.

Adjusted Balance = Previous Balance − (Payments + Credits)

New Balance = Adjusted Balance + Finance Charge + New Purchases + Fees

EXAMPLE 3

Suppose that Laura's card company uses the adjusted balance method and a monthly periodic rate. Find the finance charge for the month and the new balance.

SOLUTION

Find the adjusted balance.

Adjusted Balance = \$225.60 − \$110.99 = \$114.61

Find the periodic finance charge and rewrite it as a decimal. Then find the periodic finance charge.

18% ÷ 12 = 1.5%; 1.5% = 0.015

Periodic Finance Charge = 0.015 × \$114.61 = \$1.719, or \$1.72

Find the new balance.

New Balance = \$114.61 + \$1.72 + \$213.67 = \$330

Photodisc/Getty Images

✔ CHECK YOUR UNDERSTANDING

E. Yossi Hussein uses a credit card that carries an 18% APR and uses the adjusted balance method for calculating finance charges. Yossi's statement listed these facts: previous balance, \$310.33; purchases, \$219.67; fees, \$75; payments, \$150; and credits, \$62.69. If the credit card company uses a daily periodic rate, what is Yossi's finance charge and new balance on a 31 day billing cycle?

F. Ricky Luciano's credit card statement showed a previous balance of \$166.98, purchases and fees of \$201.88, and payments and credits of \$75. If his card carried an APR of 21% and used the adjusted balance method with a monthly periodic rate to calculate finance charges, what is Ricky's finance charge and new balance?

Wrap Up ▶ ▶ ▶

Although the two credit card offers may look the same since they have the same APR and the same annual fee, they can still vary in many other ways. Two examples are whether the card uses a daily or monthly periodic rate, and how the credit card company finds the balance subject to finance charges.

TEAM Meeting

In most bank lobbies, there is a place where brochures about bank services are available free to the public. Among these brochures is usually a stack of brochures explaining how to apply for a credit card, including the credit card features and terms. With two other students,

- Obtain copies of these brochures from several banks or visit bank web sites for information.
- After reading the brochures, make a chart listing the features common to all credit cards offered by these banks, such as balance transfer fees, late charges, and the method of calculating the balance and finance charge.
- Create columns to let you enter data for each credit card's features.
- Prepare a brief explanation of the chart that includes a discussion of the differences among the cards.

Exercises

Find the result.

1. $98.62 + $978.22 − $34.15 − $98.18
2. $789.23 + $98.21 − $44.63 − $641.09

Find the product.

3. $879.43 × 0.00526
4. $2,097.46 × 0.0002978

Complete the table below.

	Balance Subject to Finance Charge	APR	Period	Periodic Rate	# of Periods	Finance Charge
5.	$213.57	15%	Monthly		1 Month	
6.	$89.22	18%	Daily		30 Days	
7.	$866.73	12%	Monthly		1 Month	
8.	$2,479.01	21%	Daily		31 Days	
9.	$500.00	9%	Monthly		1 Month	
10.	$8,233.86	10%	Daily		30 Days	

Solve.

11. The October credit card statement for Genaro Rios had a previous balance of $175.30, new purchases and fees of $108.85, and payments and credits of $125. The card's annual percentage rate is 21% and the previous balance method is used with a monthly periodic rate. What is Genaro's finance charge for October and new balance?

12. Toni Bando's credit card has an APR of 18% figured on the previous balance. The previous balance on Toni's credit card statement for July was $308.88. During July she had new purchases and fees of $276.49, and payments and credits of $400. If the company uses a daily periodic rate for 31 days, what is her finance charge for July and her new balance?

Solve.


Photodisc/Getty Images

13. Otto Schein's credit card company charges an APR of 21% applied at a monthly periodic rate on the previous balance. Otto's December statement showed: previous balance, $397.90; new purchases, $341.89; fees, $55; payments, $500; and purchase return, $56.99. What is his finance charge for December and new balance?

14. A credit card company uses an APR of 15% and the adjusted balance method of computing finance charges using a monthly periodic rate. A credit card statement from the company lists the following: previous balance, $601.87; purchases, $209.88; fees, $75; payments, $400; and credits, $25. What was the finance charge for the month and the new balance?

15. June Christo has a credit card statement that shows an adjusted balance of $598.61, new purchases and fees of $127.88, and payments and credits of $250. Her card company charges an APR of 12% using a monthly periodic rate on the adjusted balance. What is June's finance charge and new balance?

16. **INTEGRATING YOUR KNOWLEDGE** You have two credit cards. The Banker's Card has a previous balance of $301.55, carries an APR of 18% applied using a monthly periodic rate, and uses the previous balance method of figuring finance charges. The MallCard lists a previous balance of $260.61 and payments and credits of $175. It uses the adjusted balance method to find finance charges and carries an APR of 21% with a monthly periodic rate. Find the finance charge on both cards.

17. **FINANCIAL DECISION MAKING** Your credit card statement shows an adjusted balance of $231.86, payments and credits of $125, and purchases and fees of $175.66. Your current card company uses an APR of 15% and the adjusted balance method. Another credit card company that sent you an application in the mail also uses an APR of 15% but uses the previous balance method. If both cards use a monthly periodic rate and have the same annual fee, should you switch companies? Why or why not?

18. **CRITICAL THINKING** Why will the adjusted balance method usually give a lower periodic finance charge than the previous balance method? When would the periodic finance charges be the same for both methods?

Mixed Review

19. Write the ratio of 16 to 236 as a fraction.

20. Write $\frac{8}{24}$ as a percent.

21. Write 175% as a decimal.

22. Rosa Rinaldi's total job benefits for the previous year were estimated to be $62,976. However, her job expenses for the same job were: licenses, $475; commuting costs, $2,108; tools, $197. What were her net job benefits for the year?

23. Maria Hernandez deposited these items on January 11: (bills) 15 twenties, 11 tens, 20 fives, 89 ones, (coins) 35 quarters, 65 dimes, 135 pennies, (checks) $53.69, and $138.98. She received one $100 bill back. What was her net deposit?

4-3

Average Daily Balance Method

GOALS
- Calculate finance charges using average daily balance method

KEY TERM
- average daily balance method

Start Up ▶ ▶ ▶

Ling Yi is planning on getting her first credit card while she is in college. She does not plan on carrying a balance from month to month. When she looks for a credit card, what should be her priority?

Stephen Coburn 2008/Shutterstock.com

Math Skill Builder

Review these math skills and solve the exercises that follow.

1. **Add** and **subtract** money amounts.
Find the sum. $65.98 + $486.22 + $684.81 = $1,237.01

1a. $433.92 + $87.36 + $289.11

1b. $582.33 + $86.29 − $46.33

2. **Divide** money amounts by whole numbers.

2a. $5,832.87 ÷ 31

2b. $31,875.32 ÷ 30

3. **Multiply** money amounts by decimals.
Muliply: $62.58 × 0.0021 = $0.13

3a. $486.31 × 0.000673

3b. $182.65 × 0.01975

3c. $638.19 × 0.2978

3d. $1,856.31 × 0.008271

Average Daily Balance Method

The **average daily balance method** is the most commonly used method for calculating the finance charge on a credit card. When this method is used, the periodic rate is applied to the average daily balance in the account during the billing period. The dates used are the *post* dates. The card company starts with the beginning balance for each day.

The company subtracts any payments or credits posted during that day from the beginning balance. Fees posted for that day are added to the balance. If the credit card company is using the *average daily balance method including new purchases* new purchases will be added as well. If the credit card company is using the *average daily balance method excluding new purchases* then new purchases will not be added to the daily balance. The ending balances for every day are then totaled and divided by the number of days in the billing period to get the *average daily balance.*

The following formulas are used for finding the average daily balance when new purchases are included in the calculations.

$$\text{Daily Balance with New Purchases} = \text{Beginning Balance} - (\text{Payments} + \text{Credits}) + (\text{Purchases} + \text{Fees})$$

$$\text{Average Daily Balance} = \frac{\text{Sum of Daily Balances}}{\text{Number of Days in the Billing Cycle}}$$

$$\text{New Balance} = \text{Previous Balance} + (\text{Finance Charges} + \text{New Purchases} + \text{Fees}) - (\text{Payments} + \text{Credits})$$

EXAMPLE 1

Jake Ramiro's credit card company uses the average daily balance method including new purchases to figure the finance charge. The APR is 18% on new purchases, using a monthly periodic rate. Find the finance charge for the month and the new balance.

SOLUTION

Create a chart like the one below. A transaction is either a payment or credit and subtracted from the balance, or a purchase or fee and added to the balance. The balance at the end of a day is the previous balance plus or minus any additions or deductions. The Number of Days is the number of days that the balance is in effect. The Sum of Daily Balances is the balance multiplied by the number of days.

Post Date	Transactions	Balance at End of Day	Number of Days	Sum of Daily Balances
10/1 (Bal.)	0.00	225.60	1	225.60
10/2–10/3	0.00	225.60	2	451.20
10/4	+128.99	354.59	1	354.59
10/5–10/8	0.00	354.59	4	1,418.36
10/9	+21.89	376.48	1	376.48
10/10–10/11	0.00	376.48	2	752.96
10/12	+27.79	404.27	1	404.27
10/13–10/17	0.00	404.27	5	2,021.35
10/18	−35.99	368.28	1	368.28
10/19	+35.00	403.28	1	403.28
10/20–10/23	0.00	403.28	4	1,613.12
10/24	−75.00	328.28	1	328.28
10/25–10/31	0.00	328.28	7	2,297.96

Problem Solving *Tip*

Finding the average daily balance is another use of weighted averages.

Add the column, "Sum of Daily Balances," and divide by 31, the number of days the statement covers.

$225.60 + $451.20 + $354.59 + $1,418.36 + $376.48 + $752.96 + $404.27 + $2,021.35 + $368.28 + $403.28 + $1,613.12 + $328.28 + $2,297.96 = $11,015.73

$11,015.73 ÷ 31 = $355.346, or $355.35 average daily balance

Find the monthly periodic rate and use the periodic finance charge formula to find the finance charge.

18% ÷ 12 = 1.5% = 0.015 monthly periodic rate

Finance charge = $355.35 × 0.015 = $5.33

Find the new balance.

New Balance = $225.60 + ($5.33 + $213.67) − ($35.99 + $75) = $333.61

✔ CHECK YOUR UNDERSTANDING

A. Jade Hameed's credit card statement for August showed these items: 8/1, previous balance, $108.15; 8/5, purchase, $56.89; 8/10, purchase, $61.88; 8/14, purchase, $190.23; and 8/25, payment, $150. Jade's card company uses a 1.6% monthly periodic rate and the average daily balance method including new purchases. What is Jade's finance charge for August and the new balance?

B. The credit card statement of Gloria Herrera for January listed these items: 1/1, previous balance, $89.27; 1/5, purchase, $159.34; 1/9, purchase, $108.45; 1/24, payment, $150; and 1/28, fee, $25. The card company uses the average daily balance method including new purchases and a daily periodic rate of 0.000575. What is Gloria's finance charge for January and what is her new balance?

Problem Solving *Tip*

The periodic finance charge formula is the same no matter which method is used to find the balance subject to finance charge.

Periodic Finance Charge = Balance Subject to Finance Charge × Periodic Rate × Number of Periods

When a credit card company uses the average daily balance method excluding new purchases, the same method is used except daily balances do not include any new purchases.

The following formulas are used with finding the average daily balance when new purchases are not included in the calculations.

Daily Balance Excluding New Purchases = Beginning Balance − (Payments and Credits) + Fees

$$\textbf{Average Daily Balance} = \frac{\textbf{Sum of Daily Balances}}{\textbf{Number of Days in the Billing Cycle}}$$

New Balance = Previous Balance + (Finance Charges + New Purchases + Fees) − (Payments + Credits)

EXAMPLE 2

Jake Ramiro's credit card company uses the average daily balance method excluding new purchases to figure the finance charge. Find the finance charge for the month and the new balance. The transactions on 10/4, 10/9, and 10/12 are purchases. (Refer to Example 1 for previous recorded transactions.)

SOLUTION

Create a chart like Example 1, excluding the transactions on 10/4, 10/9, and 10/12.

Post Date	Transactions	Balance at End of Day	Number of Days	Sum of Daily Balances
10/1 (Bal.)	0.00	225.60	1	225.60
10/2–10/17	0.00	225.60	16	3,609.60
10/18	−35.99	189.61	1	189.61
10/19	+35.00	$224.61	1	$224.61
10/20–10/23	0.00	$224.61	4	$898.44
10/24	−75.00	149.61	1	149.61
10/25–10/31	0.00	149.61	7	1,047.27

Add the column, "Sum of Daily Balances" and divide by 31, the number of days in the billing cycle.

$225.60 + $3,609.60 + $189.61 + $224.61 + $898.44 + $149.61 + $1,047.27 = $6,344.74

$6,344.74 ÷ 31 = $207.67 average balance excluding new purchases

Find the daily periodic rate and rewrite as a decimal.

15% ÷ 365 = 0.0411%; 0.0411% = 0.000411

Periodic Finance Charge = $207.67 × 0.000411 × 31 = $2.64

Find the new balance.

New Balance = $225.60 + ($2.64 + $213.67) − ($35.99 + $75) = $330.92

✔ CHECK YOUR UNDERSTANDING

C. In January, Lincoln Hurt's credit card statement has a beginning balance of $498.67. He made a payment of $200 on the 25th of the month. If the credit card company uses an average daily balance method excluding new purchases with a monthly periodic rate of 1.5%, what are the finance charges?

D. Jorge Itarra has a credit card with a beginning balance on 3/1 of $221.48. He made a payment of $150 on 3/15. He made other purchases during the month totaling $183.46. If the credit card has a daily periodic rate of 0.0575% applied to the average daily balance excluding new purchases, what are the finance charges for March? What is the new balance?

Problem Solving *Tip*

Remember that finance charges include interest plus fees.

Wrap Up ▶ ▶ ▶

If she plans to pay off her credit card each month, then a low annual fee is more important than the APR. However, the APR should be a secondary consideration in case she has some months where she is unable to pay the entire balance.

Exercises

Find the result

1. $1,668.43 ÷ 30
2. $2,721.24 ÷ 31
3. $984.56 × 0.000575
4. $221.67 × 0.15

When Glorica Batic received her May credit card statement she found these items listed: 5/1, previous balance, $281.59; 5/7, purchase, $168.99; 5/10, purchase, and $57.98; 5/25, payment, $200. Glorica's card company uses a 1.8% monthly periodic rate.

5. Find the finance charge if Glorica's card company uses the average daily balance including new purchases.
6. Find Glorica's new balance if the card company uses the average daily balance including new purchases.
7. Find the finance charge if Glorica's card company uses the average daily balance excluding new purchases.
8. Find Glorica's new balance if the card company uses the average daily balance excluding new purchases.

The credit card statement of Luiz Lopea for June listed these items: 6/1, previous balance, $193.39; 6/11, purchase, $175.39; 6/15, purchase, $71.84; and 6/24, payment, $75. The card company uses a daily periodic rate of 0.056%.

9. What is Luiz's finance charge for June and what is his new balance if the card company uses the average daily balance including new purchases?
10. What is Luiz's finance charge for June and what is his new balance if the card company uses the average daily balance excluding new purchases?
11. **FINANCIAL DECISION MAKING** Your credit card company uses the average daily balance method excluding new purchases. Your credit card bill is due on the 15th day of the month, and you get paid on the first of the month. How will it impact your periodic finance charges if you make an online payment on the 2nd day of the month instead of the 15th?

Mixed Review

12. Write 0.0293% as a decimal.
13. Round to the nearest ten-thousandth: 0.0583569
14. Find the average: 85, 73, 92, 77
15. Julia Hazlett earns a yearly salary of $54,000. What are her gross monthly earnings?

4-4

Cash Advances

GOALS

- Calculate total finance charges on cash advances
- Calculate credit card balances that include cash advances

KEY TERMS

- cash advance
- total finance charge

Start Up ▶ ▶ ▶

Joaquim received cash convenience checks with his credit card statement. Printed with the checks was the statement: "GET CASH WHEN YOU NEED IT! Use the attached checks for your Cash Advance needs." Joaquim is considering using the checks to pay for a stereo that he has had a hard time saving the money for. How would you advise Joaquim?

Losevsky Pavel 2008/Used under license from Shutterstock.com

Math Skill Builder

Review these math skills and then answer the questions that follow.

Math Tip

To rewrite a percent as a decimal, move the decimal point two places to the left and drop the percent sign.

1 **Divide** numbers and round.
Find the quotient and round to the nearest ten-thousandth.
$22 \div 12 = 1.8333$

1a. $14 \div 365$ **1b.** $13 \div 12$

1c. $16 \div 365$ **1d.** $18 \div 12$

1e. $22 \div 365$ **1f.** $5 \div 12$

2 **Rewrite** percents as decimals.
Rewrite 1.0835% as a decimal. 0.010835

2a. 0.0575% **2b.** 1.86% **2c.** 0.0423%

2d. 3.65% **2e.** 0.0683% **2f.** 0.235%

3 **Multiply** money amounts by percents.
Find the product. $\$404 \times 7\% = \$404 \times 0.07 = \$28.28$

3a. $\$249.00 \times 4\%$ **3b.** $\$478.83 \times 7.2\%$ **3c.** $\$219.32 \times 1.45\%$

3d. $\$875.49 \times 3.8\%$ **3e.** $\$1{,}500 \times 6\%$ **3f.** $\$346.29 \times 2.85\%$

Finance Charges on Cash Advances

When you can get cash from an ATM using your credit card, or by using checks provided by the credit card company, you are borrowing money from the credit card company. Transactions of this type are called **cash advances**.

The charges associated with cash advances are high. The periodic finance charges begin on the day you withdraw the money and there is typically no grace period for cash advances.

The APR for cash advances is higher than the APR for purchases. In addition, credit card companies often charge a fee for the cash advance.

To find the periodic finance charge, use the same formula as periodic finance charges on a regular balance. A daily periodic rate is usually applied for the number of days in the billing cycle since the withdrawal was made. The **total finance charges** for the cash advance is the sum of the periodic finance charges and any fee charged for the cash advance.

Periodic Finance Charge = Balance Subject to Finance Charge × Periodic Rate × Number of Periods

Total Finance Charges = Periodic Finance Charges + Fees

EXAMPLE 1

Benita Moya borrowed $500 for 20 days on his credit card using a cash advance. His card company charged a cash advance fee of 4% of the cash advance and a daily periodic interest rate of 0.0573%. What was the total finance charge on the cash advance?

Problem Solving *Tip*

Remember that total finance charges include the periodic finance charges plus fees.

SOLUTION

Rewrite the daily interest rate as a decimal: 0.0573% = 0.000573

Find the periodic finance charge and the fee for the cash advance.

Periodic Finance Charge = $500 × 0.000573 × 20 = $5.73

Fee = $500 × 0.04 = $20

Total Finance Charges = $5.73 + $20 = $25.73

✔ CHECK YOUR UNDERSTANDING

A. Vera Millay used her credit card in an ATM to borrow $200 on a cash advance. Her card company charged a cash advance fee of $5 and a daily periodic interest rate of 0.0487%. If Vera paid the cash advance and finance charges back at the end of 25 days, what was the total finance charge on the cash advance?

B. Akvar Assam borrowed $150 on a cash advance from his credit card company. The card company charged a cash advance fee of 3% and a daily periodic interest rate of 0.058% for the 35 days he had the cash advance. What total amount did Akbar need to pay off the cash advance and finance charges?

Credit Card Balances with Cash Advances

Finance charges for credit card accounts that have a balance with both purchases and cash advances must be figured separately because the rate for cash advances is higher than the rate for purchases.

In addition, most credit card companies apply payments to the purchase balance first, before the cash advance balance. This means that in order to pay off a cash advance, you must pay the entire balance of the credit card, or your payments will not be applied toward the cash advance and you will continue to pay the higher rate of interest on the cash advance balance.

EXAMPLE 2

Jolinda's credit card has an APR of 14% for purchases and 21% for cash advances. They use an average daily balance method with a daily periodic rate for purchases. They use a daily periodic rate for cash advances and a cash advance fee of 3%. In a 31 day billing cycle, Jolinda has an average daily balance for purchases of $543.26. She took a cash advance of $200 during the billing cycle and must pay finance charges for 26 days. What are her total finance charges?

Simone van den Berg 2008/Shutterstock.com

SOLUTION

Find the daily periodic rates for purchases and for cash advances. Rewrite as decimals.

Purchases: $14\% \div 365 = 0.0384\% = 0.000384$ periodic rate for purchases

Cash advances: $21\% \div 365 = 0.0575\% = 0.000575$ periodic rate for cash advances

Find the periodic finance charges and fees for the purchases and for the cash advance.

Purchases: $\$543.26 \times 0.000384 \times 31 = \$6.47$ periodic finance charges for purchases

Cash advance: $\$200 \times 0.000575 \times 26 = \$2.99$ periodic finance charge for cash advance

Cash advance: Fee $= \$200 \times 0.03 = \$6$ cash advance fee

Total Finance Charges $= \$6.47 + \$2.99 + \$6 = \$15.46$

✔ CHECK YOUR UNDERSTANDING

C. Jolinda made a payment on her credit card, but she did not pay off the balance. The next month, she has an average daily balance for purchases of $263.98. What are her total finance charges if it is a 30 day billing cycle?

D. It takes Jolinda a total of 15 months to pay off her credit card. On the cash advance, she paid the first month's fee and periodic finance charge plus an average of $3.50 per month for the remaining months. How much did she pay in finance charges on the $200 cash advance?

Business *Tip*

Credit card companies apply your payments to your purchase balance before your cash advance balance.

Wrap Up ▶ ▶ ▶

Joaquim can use the cash convenience checks, but they will most likely come with a hefty price in finance charges. In fact, he will probably pay more in finance charges than if he charged the price of the stereo on his credit card and made payments.

Exercises

Divide and round to the nearest ten-thousandth.

1. $19 \div 12$
2. $16 \div 365$

Rewrite the percent as a decimal.

3. 1.8745%
4. 0.0683%

Find the product.

5. $\$550 \times 6\%$
6. $\$685 \times 2.4\%$
7. $\$485 \times 4.6\%$
8. $\$856 \times 2.5\%$
9. Jareen Knabe borrowed $800 for 30 days from her credit card company using a cash advance. The daily finance charge was 0.0543%. What was the periodic finance charge on her cash advance?

Yvonne Clark used her credit card in an ATM for a $325 cash advance. Her card company charges a daily periodic interest rate of 0.06% and a cash advance fee of $19. Yvonne repaid the cash advance in 15 days.

10. What total finance charge did Yvonne pay for the cash advance?
11. How much did she pay back to the credit card company in total?

Isabel Aponte borrowed $150 on a cash advance from her credit card company. The company charges a 4% fee and an APR of 21%, calculated using a daily periodic rate, on cash advances. Isabel paid the money back in 26 days.

12. What was the total finance charge on the cash advance?
13. What total amount did Isabel pay back?

Bryan's credit card has an APR of 12% for purchases and 19% for cash advances. They use a daily periodic rate for purchases and cash advances. There is a cash advance fee of 3%. In a 31 day billing cycle, Bryan's purchase balance that is subject to finance charges is $286.26. In addition, he took an advance of $500 during the billing cycle and must pay finance charges on it for 15 days.

14. What are the periodic finance charges for the purchases?
15. What are the total finance charges for the cash advance?
16. What are the total finance charges?
17. Bryan did not pay off his credit card, and the next month the purchase balance subject to finance charges was $622.86. What are the total finance charges for a 31 day billing cycle?
18. **CRITICAL THINKING** Why is it advantageous for a credit card company to apply your payments to the purchase balance before the cash advance balance?

19. **FINANCIAL DECISION MAKING** Write guidelines for how you would use a cash advance. Include when you might take out a cash advance and how you will handle paying it back.

20. **STRETCHING YOUR SKILLS** Lupe's credit card statement for October listed these items: 10/1, previous balance, $243.86; 10/5, purchase, $45.21; 10/8, cash advance, $350; 10/12, purchase, $129; and 10/25, payment, $75. The credit card company uses the average daily balance method including new purchases. The card carries an APR of 15% on purchases and 20% on cash advances. There is a 4% fee for cash advances. If the company uses a daily periodic rate to calculate finance charges, what are the finance charges for October and what is Lupe's new balance?

Mixed Review

21. $25 × 100

22. $8.25 × 1,000

23. $5.43 × 10

24. $43.86 + $22.57

25. $500 × 20%

26. 15% of $250

Sharon Donald has a credit card with an APR on purchases of 16%. The balance transfer APR is 8% and there is a 2% balance transfer fee.

27. How much will she pay in fees to transfer $500 to the card?

28. What is the daily periodic rate on purchases, rounded to the nearest ten-thousandth?

29. If Sharon has a balance of $227.83 that is subject to daily periodic finance charges for a 31-day billing cycle, how much will she pay in periodic finance charges?

30. Lung Shen used his credit card in an ATM to borrow $300 on a cash advance. His card company charged a cash advance fee of $15 and a daily periodic interest rate of 0.049%. Lung paid the cash advance back at the end of 15 days. What was the total finance charge on the cash advance?

31. Johanna has a 3-year CD for $5,000 that pays 5.5% annual interest. She cashes the CD after 1 year and pays a penalty of 6 months' interest. How much is the penalty?

32. Alfred's paycheck has 3% withheld for state taxes. If his gross yearly wages are $35,000, how much will be withheld for state taxes?

33. Dahlia earns a salary of $50,000. What are her gross bi-monthly wages?

34. Tom Ito works 10 hours on Monday, 5 hours on Tuesday, 9 hours on Wednesday, 8 hours on Thursday, and 12 hours on Friday. His employer pays $10.50 per hour for a 40 hour work week. Any overtime hours are paid at time-and-a-half. What are Tom's gross wages for the week?

Stockbyte/Getty Images

4-5

Debt Management

GOALS

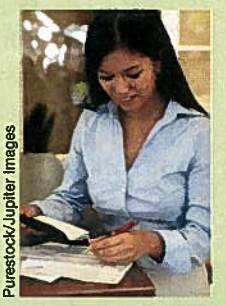
- Analyze a credit card account when minimum payments are made
- Calculate debt-to-income ratio

KEY TERMS

- debt
- debt-to-income ratio
- credit score
- consolidation loan

Start Up ▶ ▶ ▶

In her first month of having a credit card, Julianna charged $500. She was pleased to see on her statement that the minimum payment was only $7.50. She plans to make minimum payments each month until she pays the credit card off. What advice would you give Julianna?



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Math Skill Builder

Review these math skills and then answer the questions that follow.

1. **Add** and **subtract** money amounts.
Find the total. $582.41 + $12.65 + $187.15 − $27.59 = $754.62

1a. $432.91 + $65.81 + $4.55 − $200 **1b.** $103.11 + $26.43 + $1.15 − $75

2. **Multiply** money amounts by percents and round the product to the nearest dollar.
Find the product. $221.67 × 3% = $221.67 × 0.03 = $6.65, or $7.00

2a. $1,369.00 × 1.5% **2b.** $249.53 × 5% **2c.** $223.81 × 2.5%

3. **Divide** money amounts and round to the nearest percent.
Divide. $650 ÷ $1,400 = 0.464 = 46%

3a. $800 ÷ $1,375 **3b.** $375 ÷ $900 **3c.** $1,250 ÷ $4,000

Debt

Credit cards are a form of **debt** because you are using someone else's money with the promise to pay it back. Credit cards are easy to use, but that convenience can result in people spending more money than they can repay, leaving them with a situation that is difficult to get out of.

EXAMPLE 1

On January 1, Sonia has a $2,000 beginning balance on her credit card. She charges an average of $100 per month on her credit card, and each month she makes a minimum payment that is 1.5% of her current balance, rounded to the nearest dollar. Her credit card has an APR of 15%. Monthly periodic finance charges are calculated using the previous balance method. How much will she owe in 6 months? How much will she have paid in periodic finance charges?

SOLUTION

Find the monthly periodic rate.

$15\% \div 12 = 1.25\% = 0.0125$

Make a table to calculate each month's balance, finance charges, and payments.

Calculations for January:

$\$2{,}000 \times 0.0125 = \$25$ finance charge

$\$2{,}000 + \$25 + \$100 = \$2{,}125$ current balance

$\$2{,}125 \times 0.15 = \$32.25$ minimum payment

$32.25 rounded to the nearest dollar is $32.00.

$\$2{,}125 - \$32 = \$2{,}093$

Month	Previous Balance	Finance Charge	New Purchase	Current Balance	Payment	Final Balance
Jan.	$2,000	$25	$100	$2,125	$32	$2,093
Feb.	$2,093	$26.16	$100	$2,219.16	$33	$2,186.16
March	$2,186.16	$27.33	$100	$2,313.49	$35	$2,278.49
April	$2,278.49	$28.48	$100	$2,406.97	$36	$2,370.97
May	$2,370.97	$29.64	$100	$2,500.61	$38	$2,462.61
June	$2,462.61	$30.78	$100	$2,593.39	$39	$2,554.39

Total finance charges = $25 + $26.16 + $27.33 + $28.48 + $29.64 + $30.78 = $167.39

At the end of six months, Sonia will owe $2,554.39.

She will have paid $167.39 in finance charges.

EXAMPLE 2

Sonia (in Example 1) decides to stop making any charges on her credit card and continue to make the minimum payment each month. To the nearest percent, what percent of her payments went towards paying off the balance of the card?

SOLUTION

Continue the table from Example 1 to calculate each month's balance, finance charges, and payments.

To find the percentage of her payments that went towards paying off the balance, subtract the final December balance from the July previous balance and divide by the total payments she made.

Month	Previous Balance	Finance Charge	New Purchase	Current Balance	Payment	Final Balance
July	$2,554.39	$31.93	$0.00	$2,586.32	$39	$2,547.32
Aug.	$2,547.32	$31.84	$0.00	$2,579.16	$39	$2,540.16
Sept.	$2,540.16	$31.75	$0.00	$2,571.91	$39	$2,532.91
Oct.	$2,532.91	$31.66	$0.00	$2,564.57	$38	$2,526.57
Nov.	$2,526.57	$31.58	$0.00	$2,558.15	$38	$2,520.15
Dec.	$2,520.15	$31.50	$0.00	$2,551.65	$38	$2,513.65

$2,554.39 − $2,513.65 = $40.74 Amount of balance paid off in 6 months

$39 + $39 + $39 + $38 + $38 + $38 = $231 Amount paid in 6 months

$40.74 ÷ $231 = 0.176 or 18%

Only 18% of Sonia's payments went towards paying off the balance.

✔ CHECK YOUR UNDERSTANDING

A. Beginning in January, Sonia decides to pay $200 each month and make no more charges on her credit card. What is her balance at the end of 6 months?

B. What percent of Sonia's payments went towards paying off the balance of the card?

Even without making new purchases, paying only the minimum balance on a credit card will extend the payments on a card for a long time. The table below shows how long it will take to pay off a balance if a minimum payment of 1.5% is made on a credit card with an APR of 15%.

Time Required to Pay off a Credit Card with a 15% APR (making a minimum payment of 1.5%, and no new purchases)			
Beginning Balance	Time to Pay Off	Interest Paid	Total Paid
$500	6 years, 7 months	$289.59	$789.59
$1,000	25 years, 7 months	$2,442.31	$3,442.31
$2,000	48 years, 8 months	$7,442.42	$9,442.42
$3,000	62 years, 2 months	$12,442.54	$15,442.54
$5,000	79 years, 2 months	$22,442.25	$27,442.25
$8,000	94 years, 9 months	$37,442.81	$45,442.81

Consumer Alert

You are entitled to receive a free credit report every 12 months from the three major credit bureaus. Obtaining your reports annually to verify the information is a good idea.

Assessing Debt

A person's **debt-to-income ratio** is a ratio, usually expressed as a percent, that indicates the percent of one's income is spent on housing and other debts.

To find the debt-to-income ratio, add up monthly debt payments, including credit card minimum payments, loan payments, and money spent on housing. Then divide that amount by the monthly gross income.

$$\text{Debt-to-income Ratio} = \frac{\text{Debt Payments}}{\text{Gross Income}}$$

The following guidelines are used in the financial industry to classify a person's debt load. The debt-to-income ratio is used by lenders to determine who qualifies for a loan and how much that loan should be.

- 36% or less: A healthy debt load for the majority of people.
- 37%–42%: Begin reducing debts.
- 43%–49%: Likely in financial trouble.
- 50% or more: Dangerous financial position

EXAMPLE 3

Sam earns $1,500 each month. He pays $400 per month for housing, $250 per month for car loan, and $25 per month on his credit card. Find Sam's debt-to-income ratio and evaluate his financial health based on the guidelines above.

SOLUTION

Find the total debts. Divide by the monthly income.

$400 + $250 + $25 = $675

Debt-to-income ratio = $675 ÷ $1,500 = 0.45 or 45%

Sam's debt-to-income ratio is 45%. Sam is likely in financial trouble.

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✔ CHECK YOUR UNDERSTANDING

C. Hollister earns $3,000 each month. He pays $500 per month for housing, and has $50 per month in other debt payments. What is his debt-to-income ratio? Evaluate his financial health.

D. Lorna earns $2,050 each month. She pays $800 per month for housing and has $250 per month in other debt payments. What is her debt-to-income ratio? Evaluate her financial health.

Credit bureaus gather information on your credit accounts and generate a **credit score,** generally between 300 and 850. The higher your score, the less risk you pose to a creditor.

In addition to your debt-to-income ratio, credit scores may be used to evaluate your financial health. Many banks and credit card companies use your credit score to determine if you qualify for a credit card or a loan, as well as the interest rate for which you qualify.

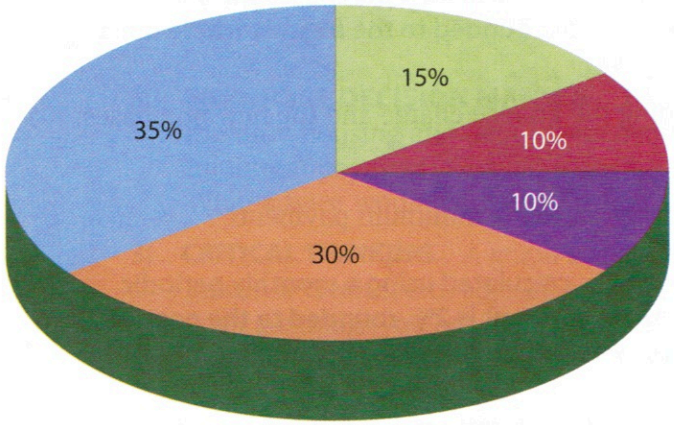
Managing and Reducing Debt

Many people struggle with debt. Below are guidelines to reduce or manage debt.

- Use cash, not credit cards.
- Transfer high interest credit card balances to lower interest accounts.
- Pay more than the minimum payment on credit cards.
- Pay off credit cards with the highest interest rates first.
- Consider debt-management counseling.
- Consider a consolidation loan.

A **consolidation loan** is money that is borrowed to pay off all of your debts. Instead of several creditors to pay each month, your debts are combined into one loan payment. This can be a viable option if you can secure a loan at a better interest rate. One pitfall, however, is that many people do not stop using their credit cards and so in time they have the consolidation loan payment and additional balances on credit cards.

Factors that Influence Credit Scores



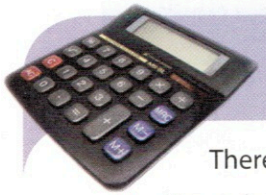
Length of credit history is a measure of how long you have used your credit accounts.

New credit includes the number of recently opened accounts and the number of credit inquiries.

Types of credit used includes how many different kinds of credit accounts you have used.

Amounts owed includes the total amount of money owed to creditors.

Payment history includes number of past due accounts, late payments and number of accounts paid as agreed.



Financial Responsibility

There are warning signs that you have too much debt. These include:

- You only make the minimum payments on your credit cards.
- You continue to use your credit cards while you are trying to pay a balance off.
- You have at least one credit card that is near, at, or over its credit limit.
- You use cash advances to pay other bills.
- You have been denied credit.

Wrap Up ▶ ▶ ▶

If Julianna continues to pay only the minimum balance on her credit card, she will be paying on that balance for a very long time, even if she stops using her credit card. If she makes new purchases, she may put herself in the situation that the card will never be paid off. Julianna should make higher payments on the credit card than the minimum amount due.

Exercises

Find the sum.

1. $99.62 + $6.81 + $24.55 − $50
2. $280 + $22.76 + $8.14 − $22

Find the product and round to the nearest whole dollar.

3. $368.00 × 1.5%
4. $145.62 × 5%
5. $529.38 × 2%
6. $2,107.88 × 2.5%

Photodisc/Getty Images

The previous balance on Josiah Evanston's credit card is $675.29. His card has an APR of 12%, with finance charges applied with a monthly periodic rate to the previous balance. He made $175 in new purchases this month. His minimum payment is 3% of his current balance, rounded to the nearest whole dollar.

7. What are his periodic finance charges?
8. What is his current balance, including the finance charge and the new purchases?
9. What is his minimum payment?
10. What will his final balance be after he makes a minimum payment?

Anya Mueller's credit card has an APR of 10%, calculated using a monthly periodic rate on the previous balance. Her minimum payment is 2%, rounded to the nearest whole dollar. Complete the table below, assuming Anya makes the minimum payment each month.

	Month	Previous Balance	Finance Charge	New Purchase	Current Balance	Payment	Final Balance
11.	July	$500		$50			
12.	Aug.			$50			
13.	Sept.			$50			
14.	Oct.			$50			
15.	Nov.			$50			
16.	Dec.			$50			

17. How much has Anya paid in periodic finance charges in 6 months?

Solve.

18. Enrique has the following monthly housing and debt payments: rent, $350; credit card minimum payment, $15; student loan payment, $60; and monthly income, $1,800. What is Enrique's debt-to-income ratio, to the nearest percent?

19. Shawna has the following monthly housing and debt payments: house payment, $600; credit card minimum payment, $50; car loan, $125; monthly income, $2,000. What is Shawna's debt-to-income ratio, to the nearest percent?

LaToya Thompson has a credit card with an APR of 15%, calculated using a monthly periodic rate on the previous balance. Her minimum payment is 4%, rounded to the nearest whole dollar. Complete the table below, assuming LaToya makes the minimum payment each month.

	Month	Previous Balance	Finance Charge	New Purchase	Current Balance	Payment	Final Balance
20.	July	$500		$0.00			
21.	Aug.			$0.00			
22.	Sept.			$0.00			
23.	Oct.			$0.00			
24.	Nov.			$0.00			
25.	Dec.			$0.00			

26. How much money has LaToya made in payments in 6 months?

27. How much has LaToya paid in periodic finance charges in 6 months?

28. How much of the balance has she paid off in 6 months?

29. To the nearest percent, what percent of her payments went towards paying off the balance?

30. **FINANCIAL DECISION MAKING** Tristen has the following monthly housing and debt payments: rent, $385; credit card minimum payment, $46; car loan, $200; monthly income, $1,500. What advice would you give Tristen?

31. **CRITICAL THINKING** A graph showing different factors that influence credit scores appears on page 157. Based on those factors, what are things you can do to have a better credit score?

32. **STRETCHING YOUR SKILLS** Janica Johannsen has just graduated from college. She has a job that pays $2,200 per month. She has monthly student loan payment of $125 and no other debts. What is the most she can spend on housing without exceeding a debt-to-income ratio of 36%?

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Mixed Review

33. What is 29% of $360?

34. $\frac{1}{2} + \frac{3}{4} + 5\frac{1}{2}$

35. Write $\frac{5}{20}$ as a percent

36. John earns a 6% commission. If his sales for the first quarter were $43,000, how much did he earn in commission?

37. Susanna Ray's gross monthly income is $4,000. She has 3% withheld from her check for state income taxes. How much is withheld per month for state income taxes?

38. Christian Rogers earns 5% annual interest on a 5-year $10,000 CD. How much will he earn in interest the first year?

Chapter Review

Vocabulary Review

Find the term, from the list at the right, that completes each sentence. Use each term only once.

- adjusted balance method
- annual percentage rate
- average daily balance method
- cash advance
- consolidation loan
- credit terms and conditions
- credit score
- debt
- debt-to-income ratio
- grace period
- periodic finance charge
- periodic rate
- previous balance method
- total finance charges

1. The percent of your income that is going towards housing and other debts is called ___?___
2. The sum of periodic finance charges and fees is called ___?___.
3. The method that calculates the balance subject to finance charges by subtracting payments and credits from the previous balance is called the ___?___.
4. The time for which you are not charged finance charges on a credit card balance is called a ___?___.
5. The monthly or daily rate charged on a credit card balance is called the ___?___.
6. Money borrowed on a credit card and received in cash is called a ___?___.
7. The yearly interest rate charged on a credit card is called the ___?___.
8. Money borrowed to pay off all of your debt is a ___?___.
9. A ___?___ is a number between 300 and 850 generated by credit bureaus regarding your credit accounts.
10. The document issued by the credit card company that outlines the costs associated with using their credit card is the ___?___.

4-1 Credit Card Costs

11. Cierro McClendon is going to transfer a $3,500 balance from one credit card to a new one. The credit card charges a 3% fee for balance transfers. What fee will he pay to transfer the balance?
12. Derek Wilson checked his credit card statement and found a purchase for $26.99 that was unauthorized. He also found that a sales slip for $35.89 had been listed as $38.59. If the new balance on his statement was $140.68, what is his correct new balance?
13. Loni Dramin's credit card statement for April showed a membership fee of $55, a late fee of $25, a finance charge of $6.45, and an over-the-limit-fee of $12. What was the total cost of the card to Loni in April?
14. Jose DeLeon's previous credit card balance was $356.83. He made $259.01 in new purchases, and received a credit of $56.83 for a return. He made a payment of $400 and was charged $4.46 in periodic finance charges. What is Jose's new credit card balance?

4-2 Credit Card Finance Charges

15. Lacy Clure is charged a finance charge on a credit card balance of $800.00. Her card has an APR of 15%. What is her monthly finance charge if the company uses a monthly periodic rate?

16. Juan Mendoza's credit card statement for October showed a previous balance of $239.80, new purchases of $174.50 and payments and credits of $95. The card's annual percentage rate is 24%. The company uses a daily periodic rate. What is Juan's finance charge and new balance for October using the previous balance method?

17. What is Juan's finance charge and new balance for October using the adjusted balance method?

4-3 Average Daily Balance Method

18. Madison Andrickson's credit card statement for August showed these items: 8/1, previous balance, $220.56; 8/5, purchase, $56.89; 8/14, purchase, $190.23; and 8/25, payment, $150. Madison's card company uses a 1.6% monthly periodic rate. What is Madison's finance charge for August and the new balance using the average daily balance method including new purchases?

19. What is Madison's finance charge for August and the new balance using the average daily balance method excluding new purchases?

4-4 Cash Advances

20. Ula Johan borrowed $250 on a cash advance from her credit card company. She was charged a daily periodic rate of 0.053% for the 25 days she had the cash advance. She was also charged a 4% cash advance fee. What was the total amount Ula had to pay back?

21. Javier's credit card has an APR of 14% for purchases and 21% for cash advances. They use an average daily balance method with a daily periodic rate for purchases. They use a daily periodic rate for cash advances and a cash advance fee of 3%. In a 31 day billing cycle, Javier has an average daily balance for purchases of $143.66. He took a cash advance of $300 during the billing cycle and must pay finance charges on the cash advance for 23 days. What are his total finance charges?

4-5 Debt Management

22. The previous balance on Delaney Shuba's credit card is $354.87. He made $210 in new purchases this month, and his periodic finance charges are $5.32. His minimum payment is 3% of his current balance, rounded to the nearest whole dollar. What is the minimum payment?

23. Raven Ingram's credit card has a previous balance of $125.62. She made $175 in new purchases during the billing cycle and made a payment of $50. She was charged $1.88 in finance charges. She wants to pay off the entire balance of the card. How much should she pay?

24. Veronica Cole earns $2,500 per month. She has a monthly student loan payment of $120 per month, and a car payment of $200 per month. She and her roommate share an apartment and split the $800 per month rent. What is Veronica's debt-to-income ratio, rounded to the nearest percent?

Technology Workshop

Task 1 Enter Data Into An Average Daily Balance Finance Charge Template

Complete a template that calculates the average daily balance, the finance charge, and the new balance for a credit card statement.

Open the spreadsheet for Chapter 4 (tech4-1.xls) and enter the data shown in blue (cells A5-B12, D19 and E19) into the spreadsheet. The values you enter are from Example 1 in Lesson 4-3. Your computer screen should look like the one shown when you are done.

The spreadsheet will calculate the:

1. Balance at the end of each day
2. Number of days the balance is in effect
3. Sum of the daily balances
4. Total of the sum of the daily balances
5. Number of days in the month
6. Average daily balance
7. Finance charge
8. New balance

	A	B	C	D	E
1	**Average Daily Balance**				
2	**Finance Charge Calculator**				
3	**Date**	**Transaction**	**Balance at End of Day**	**Number of Days**	**Sum of Daily Balances**
4					
5	10/1	225.60	225.60	3	676.80
6	10/4	128.99	354.59	5	1,772.95
7	10/9	21.89	376.48	3	1,129.44
8	10/12	27.79	404.27	6	2,425.62
9	10/18	-35.99	368.28	1	368.28
10	10/19	35.00	403.28	5	2,016.40
11	10/24	-75.00	328.28	8	2,626.24
12	11/1	0.00	328.28	0	0.00
13			Sums	31	11,015.73
14					
15	*When the last transaction is entered, enter the first day of the*				
16	*next month in the Date .*				
17					
18				**Monthly**	**Daily**
19		**Periodic Rate**		0.015	0.00000000
20		**Number of Days in Month**		31	31
21		**Average Daily Balance**		355.35	355.35
22		**Finance Charge**		5.33	0.00a
23		**New Balance**		333.61	328.28

The template can be used for either a monthly periodic rate or a daily periodic rate. To calculate values for a daily periodic rate, enter the daily periodic rate in cell E19.

After you enter the last transaction for the month, enter the first day of the next month in the next blank Date cell. In Task 1, this required you to enter the first day of the next month in cell A12.

Task 2 Analyze The Spreadsheet Output

Move the cursor to row 19 and column D, the cell for Monthly Periodic Rate. Enter the rate 0.02. Notice how the finance charge changed. This change shows what would happen if the monthly periodic rate were raised from 1.5% to 2%.

Move to cell A11 and change the date to 10/25. Notice how the sums of the daily balances, total sums of daily balances, the finance charge, and the new balance have changed.

Answer these questions about your updated spreadsheet.

1. What function is used in cell E13?
2. What arithmetic is done in cell E13?
3. What is the formula used in D21?
4. What arithmetic is done in cell D21?
5. What formula is used in cell D22?
6. What arithmetic is done in cell D22?
7. What arithmetic is done in cell D23?

Task 3 Design a Cash Advance Finance Charge Spreadsheet

You are to design a spreadsheet that will calculate the interest, total finance charge, and total amount needed to pay off a cash advance.

SITUATION: You want to borrow $500 on a cash advance for 20 days using your credit card. Your card company charges a cash advance fee of $15 and a daily periodic interest rate of 0.045%. You want to know how much interest and finance charges you must pay and what amount will be needed to pay off the loan.

Task 4 Analyze the Spreadsheet Output

Answer these questions about your completed spreadsheet:

8. How did you calculate the interest on the cash advance?
9. What would the interest be on the loan?
10. What would the finance charge be on the loan?
11. What amount is needed to pay off the loan in 20 days?
12. If you were to (a) change the interest rate to 0.07%, (b) change the cash advance fee to $20, and (c) extend the loan to 30 days, what would be the interest, finance charge, and payoff amount?

Chapter Assessment

Chapter Test

Answer each question.

1. Rewrite 1.5% as a decimal.
2. Rewrite 0.67 as a percent.
3. Find what percent \$42 is of \$120
4. What is 3% of \$500?
5. Multiply: \$242.12 × 0.000575
6. Divide: \$400 ÷ \$1,600
7. Multiply: \$583 × 0.0493% × 30
8. Divide: \$4,852.67 ÷ 31
9. Add and subtract: \$442.87 + \$281.10 + \$15.42 − \$250
10. Divide and round to the nearest ten-thousandth of a percent: 14.9% ÷ 12

Solve.

11. Jamika Hurty found an unauthorized charge of \$76.03 on her credit card statement. If the new balance on her statement was \$281.48, what is her correct new balance?
12. Jaime Escobido switched to a new credit card. He paid an annual membership fee of \$40. He also paid a balance transfer fee of 3% of his old card's \$335.81 balance. During the next year, he paid finance charges of \$13.85, \$5.92, \$2.63, and \$1.81. What was the total cost for using his credit card for the year?
13. Davida Thompson has the following monthly debts: house payment, \$500; car payment, \$225; credit card minimum due, \$52. Her monthly income is \$1,800. To the nearest percent, what is her debt-to-income ratio?
14. Joe Oyoumick's credit card requires a minimum payment of 3% of the current balance each billing cycle. If Joe's current balance is \$125.40, what is his minimum payment due?
15. Julie Myrick has a credit card that has an APR of 15%, applied at a daily periodic rate to the previous balance. Her previous balance is \$567.31. She made new purchases totaling \$128.92, and a payment of \$125 in the month of June. What is her new balance?

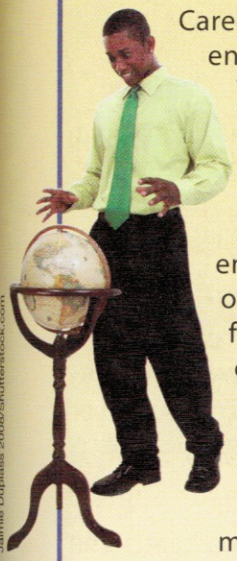
Jacob Snap has a credit card with a previous balance of \$678.32. The APR on the card is 12% and periodic finance charges are applied with a monthly rate. During the month of June, he made a \$175 purchase on 6/15 and made a payment of \$240 on 6/20.

16. If the card company uses the previous balance method, what is his finance charge?
17. If the card company uses the adjusted balance method, what is his finance charge?
18. If the credit card company uses the average daily balance method including new purchases, what is his finance charge for June?
19. If the credit card company uses the average daily balance method excluding new purchases, what is his finance charge for June?

Jim Settler takes a cash advance of \$400 for 22 days. The credit card company charges a 5% cash advance fee and an APR of 21%, applied daily.

20. What are the total finance charges for the cash advance?
21. How much will he have to pay back to the credit card company?

Planning a Career in Education



Careers in education and training entail teaching children and adults. Teachers explain concepts and how to perform particular skills to their students. Principals, secretaries, counselors, and others, support the educational environment. Workers in the field of education and training can be found in schools, colleges, training centers, child care centers, and in businesses. If you are an excellent communicator and are effective at giving instructions to others, a career in education and training may be for you.

Job Titles

- Teacher
- Reading specialist
- School counselor
- Child care provider
- Principal
- College advisor
- Speech pathologist
- School superintendent
- College professor
- Teacher's aid

Needed Skills

- outstanding communication skills
- ability to work and make decisions independently

- content area knowledge and skills
- computer and technology skills
- strong leadership skills
- genuinely like people and want to see them succeed

What's it like to work in Education?

Teacher assistants, also called teacher aids or instructional aids, support classroom teachers by supervising students, reinforcing concepts taught in class, performing clerical duties, such as keeping records or grading papers, and managing special projects with groups of students. Teacher assistants frequently work alone or in small groups with students to give them individualized instruction. Because special education students are included in the regular classroom environment whenever possible, teacher assistants often support special needs students, those with disabilities or language barriers.

What About You?

What aspect of education appeals to you? What age level are you most interested in teaching?

How Times Have Changed

Refer to the timeline on page 127 to answer the following question.

In 2007, the average American family carried about $9,000 of credit card debt. How many American households contributed to the total amount of credit card debt?

Chapters 3-4 Cumulative Review

MULTIPLE CHOICE

Select the best choice for each question.

1. Lu Yang paid an average of $32 per month in finance charges on his credit card. His credit card has an annual fee of $75. What was Lu's total cost of credit for the year?

   A. $107 **B.** $252 **C.** $267
   D. $459 **E.** $1,284

2. Olga Kirosky deposited these items in a bank: (bills) 12 twenties, (coins) 11 quarters, and 16 dimes; (checks) $125.99, and $41.65. She received 100 one-dollar bills in cash back. What was the net amount of her deposit?

   A. $311.99 **B.** $319.99 **C.** $399.99
   D. $411.99 **E.** $419.99

3. Bella Tuller has a credit card with an APR of 15% and a monthly periodic rate. The credit card company uses the previous balance method to calculate finance charges. If Bella's previous balance is $900, what are the finance charges for the month?

   A. $0.37 **B.** $11.10 **C.** $11.25
   D. $32.67 **E.** $135

4. The bank statement sent to Abigail Ochs did not show checks for $158.23, $12.89, and $71.27, and an outstanding deposit of $75 that were listed in the check register. The balance printed on the statement was $289.07. What is the reconciled bank statement balance?

   A. $121.68 **B.** $167.39 **C.** $28.32
   D. $456.46 **E.** $606.46

OPEN ENDED

5. The bank statement of Jake Hansen showed a balance of $356.93. His check register showed a balance of $308.34. When Jake compared the two records he found several differences. The bank statement listed these items not recorded in the register: ATM withdrawal, $50; ATM user fee, $2.25; direct deposit of paycheck, $624.70; checks for $287.23, $180.11, and $72.89. A check for $85.89 was recorded in the register as $58.89. The items not listed on the bank statement included checks for $72.44, $9.76, and $113.57; and a $50 deposit made after the statement closing date. Debit card purchases of $85.67 and $16.73 appeared on the statement but not in the register. Reconcile Jake's bank statement and check register.

6. Justin Niklas made this deposit to the Breakfast Book Club's checking account: (bills) 43 ones, and 13 fives; (coins) 9 quarters, 3 half-dollars, 5 dimes, 4 nickels, and 12 pennies; (checks) $397.42, and $192.81. Find the amount of the deposit.

7. After work Gerry Mathews used the ATM to deposit her paycheck for $868.39 and to withdraw $400 in cash. If her starting bank balance was $1,528.93, what is her new balance?

8. Drew Moro's check register balance was $349.64. His bank statement showed an ATM deposit of $59.39 that was not recorded in his check register, interest earned of $1.27, and a $15 charge for printing new checks. Reconcile Drew's check register.

9. Etta Warnicke deposited $20,000 in a three-year certificate of deposit that pays simple interest at a fixed annual rate of 4.9%. What total interest will Etta have earned at the end of three years?

10. Lung Shen used his credit card in an ATM to borrow $300 on a cash advance. His card company charged a cash advance fee of $15 and a daily periodic interest rate of 0.049%. Lung paid the loan back at the end of 15 days. What was the total finance charge on the cash advance?

QUANTITATIVE COMPARISON

Compare the quantity in Column A with the quantity in Column B. Select the letter of the correct answer from these choices:

A if the quantity in Column A is greater;

B if the quantity in Column B is greater;

C if the two quantities are equal;

D if the relationship between the two quantities cannot be determined from the given information.

	Column A	Column B
11.	New balance on an account that had a beginning Balance of $43.65 with checks written for $2.98, $78.23 and deposits of $211.86, $12.45	New balance on an account that had a beginning balance of $215.44 with checks written for $56.89, $112.90 and a deposit of $85
12.	1 twenty dollar bill, 6 fives, 12 dimes, and 25 pennies	4 ten dollar bills, 8 ones, 12 quarters, and 9 nickels
13.	simple interest on a $1,250 CD for 2 years at 12.5% interest rate	simple interest on a $3,200 CD for 2.5 years at 4.5% interest rate

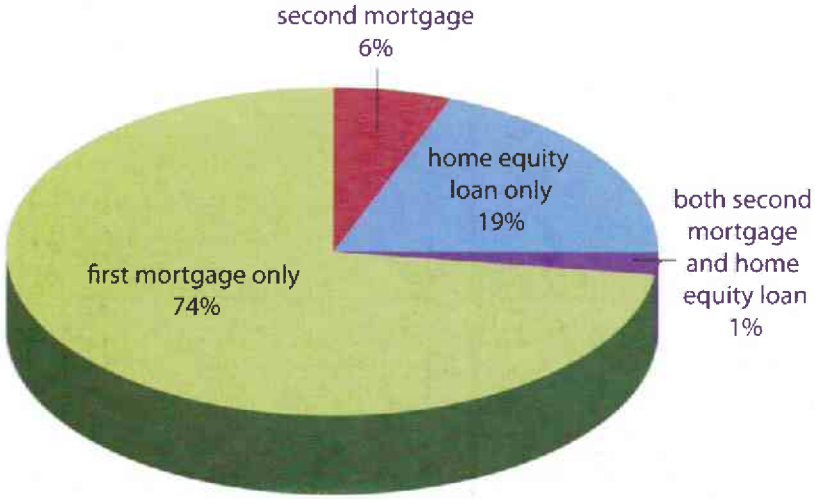
CONSTRUCTED RESPONSE

14. A friend has a $5,000 balance on her credit card. The card has a 15% APR applied at a monthly periodic rate. Your friend charges an average of $175 per month, and makes a $150 payment each month. Find the balance on the credit card after 3 months. What advice would you give your friend?

Loans

Statistical Insights

Mortgage Loans



Source: 2006 Census Reports

When a person borrows money to buy a house, the secured loan the bank issues is a mortgage. The house serves as the security the bank needs to justify the risk of loaning money. If a homeowner takes out another loan on the same house, the secured loan is a second mortgage. Some homeowners use their homes as collateral to get a home equity loan. In 2006, there were 51,234,170 houses used as collateral for mortgages or home equity. Use the pie chart to answer Questions 1–5.

1. How many homeowners have only taken a first mortgage?
2. How many homeowners have only one loan against their home?
3. How many homeowners have three loans against their home?
4. How many loans do the data in the pie chart represent?
5. **Explain** why the answer to Question 4 is greater than the number of houses in the report.

How Times Have Changed

The Federal Reserve System, created in 1913, is the organization under which the Federal Open Market Committee (FMOC) operates. Since 1933 FMOC meets at least eight times a year to set the Federal Funds Target Rate (FFTR). The FFTR, the most influential benchmark in regulating the U.S. economy, is the interest rate that banks charge each other for overnight loans. From this rate, the U. S. Prime Rate is determined. The U.S. Prime Rate is the interest rate that banks typically charge customers to borrow money. Since the second quarter of 1994, the U.S. Prime Rate has averaged 3 percentage points greater than the FFTR.

1950

1947 U.S. Prime Rate on December 1 is 1.75%.

1951 The Federal Reserve and U.S. Treasury approve the Treasury Accord. This agreement changes the way the government handles debt-management and monetary policies.

1970

1970 William McChesney Martin, appointed as Chairman of the Federal Reserve in 1951 ends his final term after leading the country through strong economic growth, low unemployment, and low inflation.

1973 Inflation skyrockets as consumer prices and the federal deficit doubles. U.S. Prime Rate increases from 6% to 9.75% in a one year period.

1980 U.S. Prime Rate reaches an all-time high of 21.5% on December 19.

1987 Paul Volcker, who is credited with bring inflation down from 13.5% to 3.2%, ends his second term as the Federal Reserve Chairman.

1990

2001 U.S Prime Rate begins the year at 9% and ends the year at 4.25%.

2006 Research to find the name of Federal Reserve Chairman that resigned after having serving under four U.S. presidents.

2008 For the first time in history (December 8), FMOC sets a range for the FFTR, 0% – 0.25%.

2010

2009 President Obama appoints Paul Volcker to lead White House economic advisory committee.

NETBookmark

The Federal Reserve web site provides information about the responsibilities of Federal Reserve System. Access **www.cengage.com/school/business/businessmath** and click on the link for Chapter 5. Other than setting the Federal Funds Target Rate, what is the primary object of the committee?

5-1

Promissory Notes

GOALS

- Calculate interest on interest-bearing promissory notes
- Calculate interest using the exact interest method
- Calculate interest using the ordinary interest method
- Calculate the rate of interest

KEY TERMS

- promissory note
- interest
- principal
- rate of interest
- exact interest method
- ordinary interest method

Start Up ▶ ▶ ▶

Make a list of the advantages and the disadvantages of borrowing money. If you borrowed $1,000 from a bank for a year, how much extra do you think you should pay them back for the benefit of using their money for a year?

Photodisc/Getty Images

Math Skill Builder

Review these math skills and solve the exercises that follow.

1 **Write** percents as decimals.
Write 67% as a decimal. 67% = 0.67

1a. 45% **1b.** 150% **1c.** 0.5%

2 **Multiply** money amounts by percents.
Find 4% of $3,500. 4% = 0.04; 0.04 × $3,500 = $140

2a. 3% of $2,580 **2b.** 6.5% of $6,340 **2c.** 5.07% of $855

3 **Multiply** money amounts by whole numbers and fractions.
Find the product: $3,000 × 2% × $\frac{1}{2}$; $3,000 × 0.02 × $\frac{1}{2}$ = $30

3a. $5,000 × 4% × $\frac{1}{4}$ **3b.** $7,520 × 6.2% × $1\frac{1}{2}$

3c. $8,356 × 4.25% × 3 **3d.** $2,698 × 1.42% × $3\frac{1}{3}$

4 **Calculate** a percent.
What percent of $350 is $14? $14 ÷ $350 = 0.04, or 4%

4a. $15 is what percent of $750? **4b.** $43 is what percent of $860?

5 **Simplify** fractions.
Simplify $\frac{24}{48} \cdot \frac{24 \div 24}{48 \div 24} = \frac{1}{2}$

5a. $\frac{180}{360}$ **5b.** $\frac{260}{360}$ **5c.** $\frac{126}{360}$ **5d.** $\frac{240}{365}$

Interest-Bearing Promissory Notes

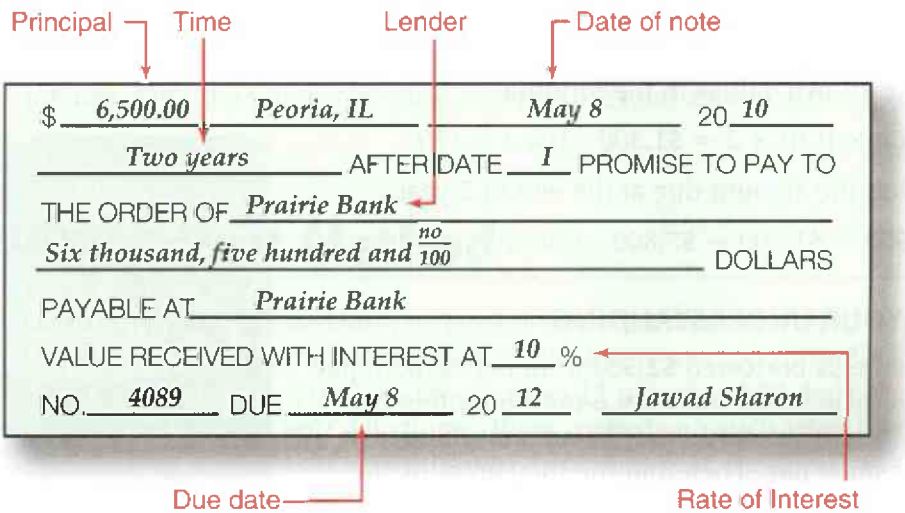
When you borrow money, you usually sign a promissory note. A **promissory note** is your written promise, or IOU, that you will repay the money to the lender on a certain date. Usually you also have to pay for using the lender's money.

That cost is called **interest**. A note that requires you to pay interest is called an *interest-bearing note*.

Lenders may require a borrower to deposit or pledge property as security for a loan. This property is called *collateral*. Types of collateral that are often used to secure loans are cars, stocks, bonds, and life insurance. If the loan is not repaid, the lender can seize the collateral and sell it to recover the borrowed money.

Many lenders offer *home equity loans* to home owners. *Home equity* is the difference between what the home could be sold for and what is owed on it. To get a home equity loan, the borrower pledges the equity in the home as collateral for the loan.

Most promissory notes today are lengthier documents than the one shown below. In whatever form the note is, it will contain the same basic information.



The amount of money borrowed on a promissory note is the *face*, or **principal**.

The date the note was signed is called the *date of the note*. The date on which the money must be repaid is the *due date*, or *maturity date*. The amount of time between the date of a note and the date that the note is due is the time of the note. Time should be expressed in years.

The rate of interest to be paid is the **rate of interest**. The amount of money that must be paid on the due date is the *maturity value* or the total amount due.

Interest rates are stated as rates *per year*. The interest you pay on a loan is proportional to the time for which you borrow the money. For a loan of three months, or $\frac{1}{4}$ of a year, the amount of interest is one-fourth of the interest for a full year. For a loan of 2 years, the amount of interest is double the interest of one year.

To calculate interest on a note, you use same formula as you used to calculate simple interest paid on savings

Interest = Principal × Rate × Time

$$I = P \times R \times T$$

To find the amount due on the due date, you add the interest to the principal.

Amount Due = Principal + Interest

$$A = P + I$$

Math *Tip*

Interest formula:

$I = P \times R \times T$

P = *principal*

R = *rate*

T = *time*

I = *interest*

EXAMPLE 1

Jawad Sharon borrowed $6,500 from his bank to buy a boat, which he used as collateral for the loan. Jawad signed a 2-year promissory note at a 10% interest rate. Find the amount of interest Jawad must pay. Then find the total amount he must repay when the note is due.

SOLUTION

Rewrite the interest rate as a decimal: 10% = 0.10

Substitute known values in the formula.

$I = \$6{,}500 \times 0.10 \times 2 = \$1{,}300$ Use $I = PRT$

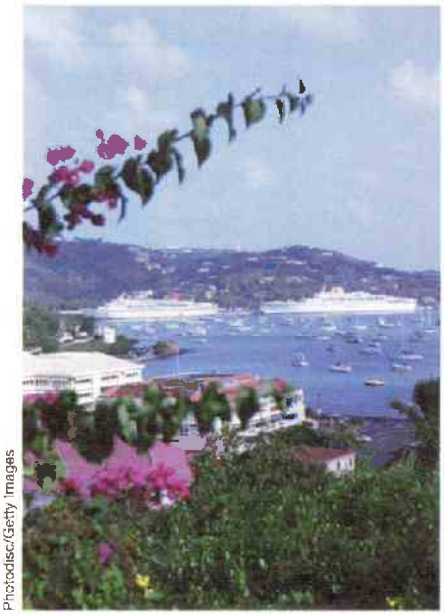
Add to find the amount due at the end of 2 years.

$A = \$6{,}500 + \$1{,}300 = \$7{,}800$ Use $A = P + I$

CHECK YOUR UNDERSTANDING

A. Leslie Regis borrowed $2,500 from her bank to pay for a cruise. Leslie signed a 6-month promissory note at 11% interest. Find the amount of interest Leslie must pay. Then find the total amount she must repay to her bank when the note is due.

B. Raanan Beilin borrowed $3,500 for 18 months from his bank to have his house repainted. Raanan signed a promissory note that carried 12% interest. Find the amount of interest Raanan must pay. Then find the total amount he must repay to his bank on the due date.



Photodisc/Getty Images

Exact Interest Method

When the time of a note is shown in days, interest may be calculated by the **exact interest method**. Exact interest uses a 365-day year. The exact interest method is used by the United States government and by many banks and other businesses.

To find exact interest, you show the time as a fraction with 365 as the denominator. For example, you would show 79 days as $\frac{79}{365}$.

EXAMPLE 2

Rosa Chavez borrows \$1,000 at 6% exact interest for 85 days.

SOLUTION

Rewrite the interest rate as a decimal: $6\% = 0.06$

$I = \$1{,}000 \times 0.06 \times \frac{85}{365} = \$13.97$ Use $I = P \times R \times T$

You can also use and simplify fractions to find the solution.

Write the percent as a fraction. $6\% = \frac{6}{100}$

Write and simplify the time fraction: $\frac{85}{365} = \frac{17}{73}$

$\$1{,}000 \times \frac{6}{100} \times \frac{17}{73} = \frac{1020}{73} = \$13.97$ Use $I = P \times R \times T$ with fractions

CHECK YOUR UNDERSTANDING

C. Ana Lopez borrows \$5,000 for 75 days at 8% exact interest. Find how much interest she must pay on the loan and how much will be due at maturity.

D. Albert O'Malley signs a promissory note for \$3,500 for 150 days at 9% exact interest. Find the interest he must pay and the total amount due on the due date.

Calculator Tip

To use a calculator:

Enter 1000
Press ×
Enter .06
Press =
Press ×
Enter 85
Press =
Press ÷
Enter 365
Press =

Ordinary Interest Method

The **ordinary interest method**, or *banker's interest method* is used in place of the exact interest method by some businesses. With this method of finding interest, a year has only 360 days. The 360-day year has 12 months of 30 days each and is known as the *banker's year*. Of course, there really is no such year. It is used because it is easier to calculate with than a 365-day year.

EXAMPLE 3

Rosa Chavez borrows \$1,000 at 6% ordinary interest for 85 days.

SOLUTION

$I = \$1{,}000 \times 0.06 \times \frac{85}{360} = \$14.17$ Use $I = P \times R \times T$

$I = \$1{,}000 \times \frac{6}{100} \times \frac{85}{360} = \frac{85}{6} = \$14.17$ Use $I = P \times R \times T$ with fractions

CHECK YOUR UNDERSTANDING

E. Ikuko Kimura signed a promissory note for \$5,900 at 12% ordinary interest for 180 days. Find the interest and amount due she will pay when the note is due.

F. On May 6, Solomon Kaufman borrowed \$4,000 signing a promissory note at his bank. The note carries 9% ordinary interest and is due in 4 months. Find the interest and amount due that Solomon must pay at maturity.

Rate of Interest:

If you know the principal and the amount of interest for one year, you can find the rate of interest by dividing the interest by the principal.

Rate of Interest = Interest for One Year ÷ Principal

If the interest given in the problem is not for a year, you must first find how much the interest would be for one year.

Algebra Tip

Use the rate of Interest formula:

$R = \frac{I}{P}$

where R is rate of interest, I is interest for one year, and P is the principal

EXAMPLE 4

Ella Stein paid $30 interest on a loan of $1,000 for 3 months. Find the rate of interest she paid.

SOLUTION

Find the amount of interest for one year by finding the number of 3-month periods in one year.

12 months ÷ 3 months = 4 number of 3-month periods in one year

$30 × 4 = $120 interest for one year

$R = \$120 \div \$1{,}000 = 0.12$, or 12% Use $R = \frac{I}{P}$

CHECK YOUR UNDERSTANDING

G. Trish Newcomb must pay $320 in interest on a promissory note for $8,000 due 4 months from the date of the note. Find the rate of interest she will pay.

H. Susilo Wahyudi paid $450 in interest on a 3-month note for $12,000. Find the rate of interest he paid.

Photodisc/Getty Images

Consumer Alert

Payday Loans = HIGH Interest

Payday loans are usually short term loans designed to provide money until the next payday. While payday loans might seem like a convenient way to get out of a jam, the interest rate for these loans can range from 400% – 800%.

A common payday loan is for $500 with $25 per $100 due for interest. If the loan is to be repaid in two weeks, what is the interest rate for this loan?

Companies offering payday loans may ask borrowers to leave a check for the principal and the interest that will be cashed on the day the loan is due. Online companies may ask for electronic access to the borrower's bank account to electronically withdraw funds on the due date. The Consumer Federation of America recommends never transmitting bank account numbers, Social Security numbers, or other personal financial information over the Internet or by fax to unknown companies.

Wrap Up ▶ ▶ ▶

Look back at the list of the advantages and disadvantages of borrowing money. What advantages or disadvantages would you add to the list? Calculate the rate of interest for the amount of interest you identified in the Start Up on a one-year, $1,000 loan.

TEAM Meeting

The rate of interest on a loan is directly tied to the risk to the lender. Lenders typically give the lowest interest rates to people and businesses that they believe will be responsible to pay back the loan. Organize a team and brainstorm a list of things that a bank might consider when evaluating whether a person or a business is a low or high credit risk. Contact several banks to evaluate and edit your list.

Exercises

Find the product.

1. 2% of $4,689
2. 150% of $84
3. $2,200 × 6% × 5

Find the percent.

4. 75 as a percent of 3,000
5. $150 as a percent of $1,200
6. Write these as a decimal: 2.3%, 230%, 23%

Find the interest to be paid for each promissory note.

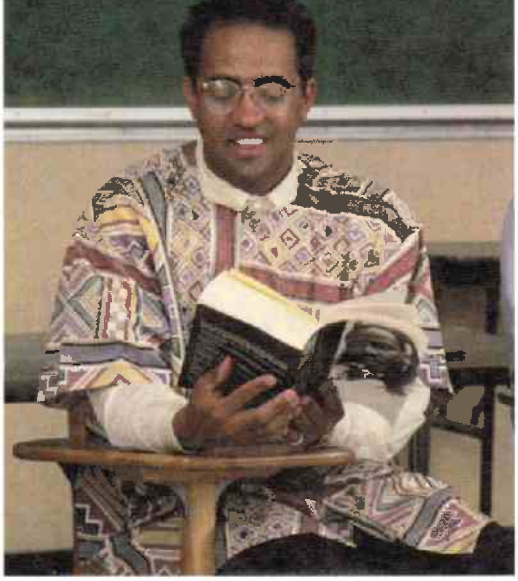
	Principal	Rate	Time in Years	Interest
7.	$2,500	15%	2	
8.	$12,500	12%	$3\frac{1}{2}$	
9.	$500	8%	$\frac{1}{2}$	

Find the interest and the amount due at maturity for each note.

	Face of Note	Time	Rate	Interest	Amount Due at Maturity
10.	$500	3 yr	12%		
11.	$150	3 mo	18%		
12.	$920	$2\frac{1}{4}$ yr	$5\frac{1}{2}$%		

Solve:

13. To finance the remodeling of her kitchen, Rosa borrowed $26,400 on an 18-month home equity loan. She signed a promissory note bearing interest at $7\frac{1}{2}\%$. What total amount did Rosa pay on the due date?



Photodisc/Getty Images

14. Rondel Wilson borrowed $2,000 to replace the furnace in his house. The promissory note he signed was for 3 months at $15\frac{1}{4}\%$ interest. How much did Rondel have to pay when the note came due?

15. Khalil Hamid Ali borrowed $12,000 and paid $1,890 in exact interest when the loan came due $1\frac{1}{2}$ years later. What rate of interest did Khalil pay?

16. Lynn Wessel borrowed $2,500 for 18 months. The total interest she paid was $315. What rate of interest did Lynn pay?

Find the exact interest to the nearest cent. Then find the ordinary interest to the nearest cent.

17. $360 @ 14% for 210 days

18. $1,500 @ 15% for 36 days

19. $1,200 @ 6% for 240 days

20. $2,400 @ 9% for 60 days

21. $450 @ 12% for 146 days

22. $1,450 @ 7% for 100 days

Bill Rich signed a 180-day note for $1,250. He repaid the loan when due with interest at an annual rate of 12% using a banker's year.

23. How much interest did Bill pay?

24. What total amount did he pay?

Find each interest rate.

25. Kelly Bullock borrowed $4,800 for 6 months and paid $264 interest. What rate of interest did she pay?

26. Tony Colito paid $19.50 in interest on a loan of $2,600 for 1 month. What rate of interest did he pay?

Tara Long borrowed $10,000 for 180 days. She paid exact interest at an annual rate of 12%.

27. Estimate the interest Tara owed.

28. What is the exact amount of interest she had to pay?

29. What total amount did she have to repay?

30. **FINANCIAL DECISION MAKING** Maria is shopping for a $2,000 loan for 1 year. One lender offers her a loan with 9% interest. The other lender offers her a loan with 7.5% interest, but she must use her car as collateral for the loan. What would you advise Maria to do?

FINANCIAL DECISION MAKING You can borrow $5,600 at 12% interest for 90 days from a lender that uses the exact interest method. You can borrow $5,600 at 12% for 90 days from a lender that uses the ordinary interest method.

31. Which lender offers the loan with the lowest interest?

32. How much less interest will you pay?

33. **STRETCHING YOUR SKILLS** A family sells their home for $150,000 through a real estate agent who deducts $9,000 commission. Other costs they were charged to complete the sale totaled $1,875. What percent of the sale price did the family receive, to the nearest whole percent?

Mixed Review

34. $632.7 + 25.23 + 0.17$

35. 4.15×0.822

36. Write $5\frac{7}{8}\%$ as a decimal.

37. \$80 is $6\frac{1}{2}\%$ of what amount?

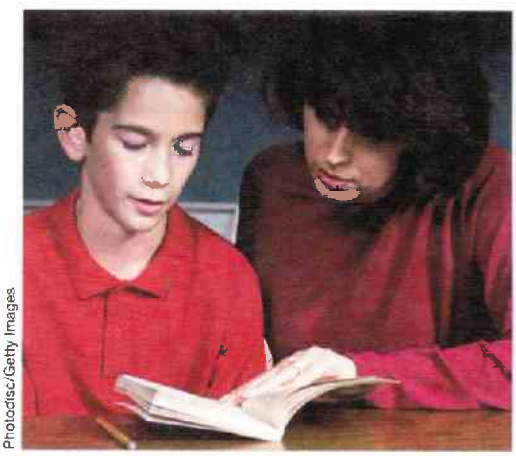
38. \$5.32 is 5% less than what amount?

39. Ellen Carson's sales for 5 months were \$26,908, \$28,386, \$28,730, \$27,290, and \$29,009. What must be her sales next month if she wants her monthly sales average to be \$28,000 for the 6 months?

40. Klaus Reinhardt, a secretary, is paid a yearly salary of \$24,960. This is equal to how much a week?

41. On April 31, Steve Daley's balances were checkbook, \$339.11, and bank statement, \$394.62. A service charge of \$1.74 had not been deducted in the checkbook. Checks outstanding were 134, \$41.32; 135, \$3.18; 137, \$12.75. Prepare a reconciliation statement for Steve.

42. Shannon Burke is a substitute teacher. On the days she works she is paid \$85 a day. What is Shannon's pay for 3 days of work?



Photodisc/Getty Images

Anthony Delgado has a credit card with an APR of 15%. His balance that is subject to finance charges is \$285.92

43. What is his monthly periodic rate?

44. What are the periodic finance charges using a monthly periodic rate?

5-2

Calculating Interest

GOALS

- Calculate interest using simple interest tables
- Calculate interest using the daily interest factor

KEY TERM

- daily interest factor

Start Up ▶ ▶ ▶

If today is November 2nd and you have a project due on December 16th, how many days do you have to complete the project?

Math Skill Builder

Review these math skills and solve the exercises.

1. Find the number of days between the two given dates.
Find the number of days between January 3 and January 15: $15 - 3 = 12$

1a. March 11 and March 31 **1b.** September 5 and September 10

2. **Divide** by 100.
Find the quotient. $\$7{,}200 \div \$100 = 72$

1a. $\$890 \div \$100$ **1b.** $\$12{,}089 \div \$100$ **1c.** $\$103{,}278 \div \$100$

3. **Multiply** money amounts by decimals and round to nearest cent.
Find the product. $\$475 \times 0.6283 = \$298.442$, or $\$298.44$

2a. $\$1{,}800 \times 0.4186$ **2b.** $\$943 \times 0.5289$ **2c.** $\$11{,}093 \times 0.3752$

Simple Interest Tables

Most banks use computers or specially programmed calculators to find interest and calculate payment amounts on loans. However, some lenders use interest tables (like the one shown on the next page) as a quick reference chart.

The table shows the interest on \$100 for a 365-day year for up to a 31-day loan. To find the interest on any amount of money using the table, follow these steps:

1. To find the number of hundreds of dollars in the principal, divide the principal by \$100. Simply move the decimal in the principal two places to the left.
2. Use the number from the chart that matches your interest rate and time and multiply it by the number of hundreds in the principal.

SIMPLE INTEREST TABLE

Interest on $100 for a 365-Day Year

Time (Days)	8%	8 1/2%	9%	9 1/2%	10%	10 1/2%	11%	11 1/2%	12%	12 1/2%
1	0.0219	0.0233	0.0247	0.0260	0.0274	0.0288	0.0301	0.0315	0.0329	0.0342
2	0.0438	0.0466	0.0493	0.0521	0.0548	0.0575	0.0603	0.0630	0.0658	0.0685
3	0.0658	0.0699	0.0740	0.0781	0.0822	0.0863	0.0904	0.0945	0.0986	0.1027
4	0.0877	0.0932	0.0986	0.1041	0.1096	0.1151	0.1205	0.1260	0.1315	0.1370
5	0.1096	0.1164	0.1233	0.1301	0.1370	0.1438	0.1507	0.1575	0.1644	0.1712
6	0.1315	0.1397	0.1479	0.1562	0.1644	0.1726	0.1808	0.1890	0.1973	0.2055
7	0.1534	0.1630	0.1726	0.1822	0.1918	0.2014	0.2110	0.2205	0.2301	0.2397
8	0.1753	0.1863	0.1973	0.2082	0.2192	0.2301	0.2411	0.2521	0.2630	0.2740
9	0.1973	0.2096	0.2219	0.2342	0.2466	0.2589	0.2712	0.2836	0.2959	0.3082
10	0.2192	0.2329	0.2466	0.2603	0.2740	0.2877	0.3014	0.3151	0.3288	0.3425
11	0.2411	0.2562	0.2712	0.2863	0.3014	0.3164	0.3315	0.3466	0.3616	0.3767
12	0.2630	0.2795	0.2959	0.3123	0.3288	0.3452	0.3616	0.3781	0.3945	0.4110
13	0.2849	0.3027	0.3205	0.3384	0.3562	0.3740	0.3918	0.4096	0.4274	0.4452
14	0.3068	0.3260	0.3452	0.3644	0.3836	0.4027	0.4219	0.4411	0.4603	0.4795
15	0.3288	0.3493	0.3699	0.3904	0.4110	0.4315	0.4521	0.4726	0.4932	0.5137
16	0.3507	0.3726	0.3945	0.4164	0.4384	0.4603	0.4822	0.5041	0.5260	0.5479
17	0.3726	0.3959	0.4192	0.4425	0.4658	0.4890	0.5123	0.5356	0.5589	0.5822
18	0.3945	0.4192	0.4438	0.4685	0.4932	0.5178	0.5425	0.5671	0.5918	0.6164
19	0.4164	0.4425	0.4685	0.4945	0.5205	0.5466	0.5726	0.5986	0.6247	0.6507
20	0.4384	0.4658	0.4932	0.5205	0.5479	0.5753	0.6027	0.6301	0.6575	0.6849
21	0.4603	0.4890	0.5178	0.5466	0.5753	0.6041	0.6329	0.6616	0.6904	0.7192
22	0.4822	0.5123	0.5425	0.5726	0.6027	0.6329	0.6630	0.6932	0.7233	0.7534
23	0.5041	0.5356	0.5671	0.5986	0.6301	0.6616	0.6932	0.7247	0.7562	0.7877
24	0.5260	0.5589	0.5918	0.6247	0.6575	0.6904	0.7233	0.7562	0.7890	0.8219
25	0.5479	0.5822	0.6164	0.6507	0.6849	0.7192	0.7534	0.7877	0.8219	0.8562
26	0.5699	0.6055	0.6411	0.6767	0.7123	0.7479	0.7836	0.8192	0.8548	0.8904
27	0.5918	0.6288	0.6658	0.7027	0.7397	0.7767	0.8137	0.8507	0.8877	0.9247
28	0.6137	0.6521	0.6904	0.7288	0.7671	0.8055	0.8438	0.8822	0.9206	0.9589
29	0.6356	0.6753	0.7151	0.7548	0.7945	0.8342	0.8740	0.9137	0.9534	0.9932
30	0.6575	0.6986	0.7397	0.7808	0.8219	0.8630	0.9041	0.9452	0.9863	1.0274
31	0.6795	0.7219	0.7644	0.8068	0.8493	0.8918	0.9342	0.9767	1.0192	1.0616

EXAMPLE 1

Find the interest from July 8 to July 28 on $850 at 12%.

SOLUTION

Find the number of days from July 8 to July 28. $28 - 8 = 20$ days

Find the interest on $100 for 20 days at 12%

$0.6575 interest from the table

$850 ÷ $100 = 8.5 the number of $100s in the principal

Multiply the interest by the number of 100s.

$0.6575 × 8.5 = $5.588, or $5.59

Problem Solving *Tip*

To avoid reading the wrong table amount, place a ruler or piece of paper under the line you need to read.

✔ CHECK YOUR UNDERSTANDING

A. Find the interest from April 6 to April 18 on $620 at 10%.

B. Find the interest from December 7 to December 18 on $550 at $9\frac{1}{2}$%

multipliers to get the number.

When the number of days you want is not shown in the table, you must combine multipliers to get the number.

EXAMPLE 2

Find the interest from May 20 to June 25 on \$450 at 8%.

SOLUTION

May 20 − May 30 = 10 days

June 1 − June 25 = 25 days

Total = 35 days

\$0.6575 interest on \$100 for 30 days at 8%

\$0.1096 interest on \$100 for 5 days at 8%

Add the interest for 30 days and 5 days

\$0.6575 + \$0.1096 = \$0.7671 interest on \$100 for 35 days

\$450 ÷ \$100 = 4.5 the number of \$100s in the principal

Multiply the interest for 35 days by the number of 100s in the principal.

\$0.7671 × 4.5 = \$3.452, or \$3.45

Interest for a rate not shown on the table can be found in much the same way. For example, the interest on \$100 @ $18\frac{1}{2}\%$ for 20 days is the sum of the amount for 9% (\$0.4932) and the amount for $9\frac{1}{2}\%$ (\$0.5205).

CHECK YOUR UNDERSTANDING

C. Find the interest from May 1 to June 9 on \$1,320 at 10%.

D. Find the interest from August 4 to October 5 on \$740 at 12%.

Problem Solving *Tip*

This old poem has been used by many to remember the number of days in the months:

Thirty days hath September, April, June and November.

All the rest have thirty-one, except February, which has 28.

Photodisc/Getty Images

Daily Interest Factor

The **daily interest factor** tells you how much interest a note is accumulating per day. You can use the daily interest factor to calculate the interest on a note.

Before you to substitute a number for the rate into the daily interest factor formula, change the percent to a decimal.

$$\text{Daily Interest Factor} = \text{Principal} \times \frac{\text{Rate}}{\text{Number of Days in Year}}$$

Business *Tip*

Exact interest method uses 365 days in a year.

Ordinary interest method uses 360 days in a year.

EXAMPLE 3

Find the daily interest factor for \$100 borrowed at 9% exact interest.

SOLUTION

Use the daily interest factor formula.

$$100 \times \frac{0.09}{365} = \$0.0247$$

✔ CHECK YOUR UNDERSTANDING

E. What is the daily interest factor for \$600 borrowed at 18% exact interest?

F. What is the daily interest factor for \$1,200 borrowed at 6% ordinary interest?

You can use the daily interest factor to calculate the interest due over a period of days.

EXAMPLE 4

Find the ordinary interest from March 3 to March 15 on \$1,000 at 15% interest.

SOLUTION

Find the daily interest factor and multiply it by the number of days

$1{,}000 \times \frac{0.15}{360} = \$0.4167$ daily interest factor

$15 - 3 = 12$ days number of days from March 3 to March 15

$\$0.4167 \times 12 = \$5.00$

✔ CHECK YOUR UNDERSTANDING

G. Find the ordinary interest from November 8 to November 22 on \$750 at 9% interest.

H. Find the ordinary interest from August 5 to September 4 on \$2,500 at 10% interest.

Math *Tip*

Round the daily interest factor to the nearest ten-thousandth. If you round to the nearest cent, there will be too great of an error when you use the daily interest factor in other calculations.

Spreadsheet *Tip*

Spreadsheets can be used to find the days between dates. Enter the first date in B1 and the other date in B2. Then in B3 enter: = B2 − B1. Next format B3 to display a *number* with *no decimal places.*

Communication

Search the Web to find at least 4 calculators that you can use online. Include simple interest and compound interest calculators, Then, test each calculator by solving these two problems with them:

1. Find the simple interest on \$1,200 for $\frac{1}{2}$ year at 12%.
2. Find the compound interest on \$1,200 for 1 year at 5% compounded monthly.

Choose 1 of the calculators and write a review containing the name of each calculator, the major types of calculations it can handle, its Web address, the ease with which you can understand how to use it, and whether it answered the problems above correctly.

Wrap up

The elapsed time you found should have been 45 days. What does "elapsed time" mean? Explain the steps you took to determine elapsed time. Why do you need to find the elapsed time? Work with a partner. Have one person name a starting date and an ending date and the other find the elapsed time. Exchange roles and repeat.

Exercises

Find the number of days between the two given dates.

1. April 5 to April 27
2. September 18 to September 30
3. January 19 to February 16
4. July 6 to September 12

Find the product or quotient.

5. $\$418 \div 100$
6. $\$297 \times 0.2851$
7. $\$310{,}790 \div 100$
8. $\$5{,}300 \times 0.9184$
9. $\$51{,}280 \div 100$
10. $\$31{,}627 \times 0.5028$

Use the Simple Interest Table to find the interest to the nearest cent.

11. \$500 @ 8% for 20 days
12. \$380 @ 12% for 12 days

Use the Simple Interest Table to find the interest for the given dates to the nearest cent.

13. \$6,150 @ 9% for 12/5 to 12/30
14. \$275 @ $12\frac{1}{2}$% for 3/8 to 3/28
15. \$400 @ $9\frac{1}{2}$% for 5/10 to 6/24
16. \$725 @ 11% for 7/12 to 9/10
17. \$270 @ 18% for 4/22 to 8/20
18. \$540 @ 21% 1/28 to 2/17

Lucia Flores borrowed \$1,700 on a note for 60 days with interest at 12%.

19. Using the Simple Interest Table, what interest did she pay?
20. What total amount did she owe when the note was due?

Find the daily interest factor. Round to the nearest ten-thousandth.

21. \$825 @ 17% exact interest
22. \$975 @ 15% exact interest
23. \$450 @ 11% ordinary interest
24. \$625 @ 12% ordinary interest
25. \$2,250 @ 9% exact interest
26. \$1,250 @ 6% exact interest
27. \$1,500 @ 10% ordinary interest
28. \$1,000 @ 18% ordinary interest

Use the daily interest factor to find the interest to the nearest cent.

29. \$725 from April 12 to April 28 @ 11% exact interest

30. \$1,200 from October 2 to October 21 @ 9% ordinary interest

31. \$550 from January 19 to February 15 @ 6% exact interest

32. \$950 from March 29 to April 10 @ 15% ordinary interest

33. \$2,150 from December 15 to February 9 @ 7% ordinary interest

34. \$1,650 from September 23 to November 2 @18% exact interest

INTEGRATING YOUR KNOWLEDGE On March 5, Jake Lowry signed a note for \$15,000 at 15% exact interest. He paid the note on June 3.

35. What amount of interest did Jake owe?

36. What was the total amount due on June 3?

37. On July 13, Rosa D'Lario borrowed \$9,000 to buy a new car for \$14,500. She signed a note with exact interest at 8%. If she paid 100% of the note off on September 24, what total amount did she owe?

38. **FINANCIAL DECISION MAKING** You can borrow \$2,500 at 15% ordinary interest for 6 months from one lender. Another lender offers you a loan of \$2,500 at 14% ordinary interest for 8 months. Which loan is the better deal? Justify your decision.

Mixed Review

39. $\frac{1}{8} + \frac{1}{6}$

40. $2{,}078.01 - 43.098$

41. $12\frac{1}{4} - 3\frac{1}{2}$

42. What amount is $2\frac{1}{4}\%$ of \$900?

43. What amount is $5\frac{3}{5}\%$ of \$1,200?

44. The interest on a loan of \$8,600 for 3 months is \$258. What is the rate of interest?

45. Jeanne Dixon is paid \$2.25 for each fan she assembles. During the five days of last week, she assembled these fans: 27, 28, 33, 30, 31. What was Jeanne's gross pay for the week?

46. Find the interest on \$745 for 25 days at 8% using the Simple Interest Table.

47. Residents that live in Devon have an average annual taxable income of \$38,445. The city's income tax rate is $\frac{7}{8}\%$. How much does the average resident pay in city tax each year?

Photodisc/Getty Images

48. Use the Simple Interest Table in Lesson 3-2 to find the interest on a \$1,400 loan at $12\frac{1}{2}\%$ for 29 days.

5-3

Installment Loans

GOALS

- Calculate the installment price and finance charge on an installment plan purchase
- Calculate the number and amount of monthly payments
- Calculate the interest, principal payment, and new balance on an installment loan

KEY TERMS

- down payment
- finance charge
- installment loan

Start Up ▶ ▶ ▶

Darrel just graduated from high school. He needs a car to get a job but he also needs a job to afford a car. What choices does Darrel have to solve his problem?

Photodisc/Getty Images

Math Skill Builder

Review these math skills and solve the exercises that follow.

1 **Add** and **subtract** dollar amounts.
Find the sum. $109.45 + $29.01 = $138.46
Find the difference. $244.21 − $62.09 = $182.12

1a. $1,905.34 + $804.23

1b. $15,378.82 + $598.38

1c. $5,074 − $2,985

1d. $56.89 − $12.98

1e. $5,083.20 − $799.43

1f. $8,001.35 + $56.08

2 **Multiply** dollar amounts by whole numbers and decimals.
Find the products. $34.19 × 6 = $205.14 and $106.80 × 0.015 = $1.602, or $1.60

2a. $537 × 8

2b. $1,790 × 0.2

2c. $450 × 0.045

2d. $0.95 × 120

3 **Divide** dollar amounts by whole numbers and dollar amounts.
Find the quotients. $340 ÷ 8 = $42.50 and $56.30 ÷ $500 = 0.1126

3a. $1,080 ÷ 12

3b. $36 ÷ $1,200

3c. $171 ÷ $3,800

3d. $54 ÷ 36

Installment Price and Finance Charge

Sound systems, boats, cars, furniture, and many other items can be bought on an installment plan, also called a time payment plan. When you buy on an *installment plan*, you are borrowing money and paying it back in part payments.

You may have to make a **down payment**, or part of the purchase price. An *installment contract* will outline the responsibility for paying the unpaid balance.

The installment price is higher than the cash price because the seller adds a **finance charge** to the cash price. This charge pays the seller interest on the money and covers the extra cost of doing business on the installment plan. The finance charge is the difference between the installment price and the cash price.

EXAMPLE 1

A desktop computer system has a cash price of $1,200. To buy it on an installment plan, you pay $100 down and $38 a month for 36 months. Find the finance charge. By what percent is the installment price greater than the cash price?

SOLUTION

Add the total of the monthly payments and the down payment to find the installment price.

$\$38 \times 36 = \$1{,}368$ total monthly payment

$\$1{,}368 + \$100 = \$1{,}468$ installment price

Subtract the cash price from the installment price to find the finance charge.

$\$1{,}468 - \$1{,}200 = \$268$ finance charge

Divide the finance charge by the cash price to find the percent that the installment price is greater than the cash price.

$\$268 \div \$1{,}200 = 0.22\overline{3}$, or $22\frac{1}{3}\%$ percent greater

✔ CHECK YOUR UNDERSTANDING

A. You can buy a watch for $125 cash or pay $25 down and the balance in 12 monthly payments of $9. What is the installment price? By what percent would your installment price be greater than the cash price?

B. A digital audio player that sells for $169.95 can be bought for $20 down and $26.17 a month for 6 months. What is the installment price? By what percent, to the nearest tenth, does the installment price exceed the cash price?

Monthly Installment Payments

Sometimes you may know the installment price and down payment and need to find the amount of the monthly payment or the number of months to pay.

EXAMPLE 2

The installment price of a set of water skis is $190. You must pay $50 down and make payments for 16 months. What will be your monthly payments?

SOLUTION

Subtract the down payment from the installment price to find the remaining amount to pay.

$190 − $50 = $140 remainder to pay

Divide the remaining amount to pay by the number of months to pay to find the monthly payment.

$140 ÷ 16 = $8.75 monthly payment

Photodisc/Getty Images

✔ CHECK YOUR UNDERSTANDING

C. A scuba diver's wetsuit costs $175 on the installment plan. You must make a down payment of $25 and make payments for 15 months. What will be your monthly payments?

D. A refrigerator sells for $1,044 on the installment plan. After making a down payment of $100, you pay $59 a month. How many months will it take to pay for the refrigerator?

Installment Loans

Rather than pay a retail store a down payment and monthly payments, you can obtain an **installment loan** from a bank or credit union. You repay the principal and interest in installments, usually monthly. Typically, the interest rate on an installment loan from a bank will be less than the rate offered for a retail store installment plan.

Many lenders calculate payments so that each payment is the same amount. This payment method is called the *level payment plan*. From each payment, the interest due for that month is deducted. The payment amount remaining after deducting the interest is applied to the principal.

If the interest rate on the loan is 1.5% a month, this rate is equal to 18% a year (1.5 × 12 = 18). Sometimes a service charge is added to the cost of the loan.

On the next page is a schedule of payments on a one-year, $500 loan at 18%. The loan was repaid in 12 equal monthly payments of $45.84.

Spreadsheet *Tip*

The spreadsheet function *PMT* lets you compute the monthly payment needed in a level payment loan. In Excel, the function for a $500 loan for 1 year at 18% is =PMT(0.18/12,12,500,0) 0.18/12 is the monthly interest rate. The number of months is 12. The principal is 500 and 0 means the monthly payment is made at the end of the month. A 1 would mean the monthly payment is made at the beginning of the month.

Loan Repayment Schedule				
Month	Monthly Payment	Interest Payment	Applied to Principal	Balance
1	45.84	7.50	38.34	461.66
2	45.84	6.92	38.92	422.74
3	45.84	6.34	39.50	383.25
4	45.84	5.75	40.09	343.15
5	45.84	5.15	40.69	302.46
6	45.84	4.54	41.30	261.16
7	45.84	3.92	41.92	219.24
8	45.84	3.29	42.55	176.68
9	45.84	2.65	43.19	133.50
10	45.84	2.00	43.84	89.66
11	45.84	1.34	44.50	45.16
12	45.84	0.68	45.16	0.00
Totals	550.08	50.08	500.00	

Notice that the interest paid in any month is equal to the unpaid balance multiplied by the monthly interest rate. A loan that uses this method of allocating interest is called a *simple interest installment loan.*

EXAMPLE 3

The Winstons borrowed $500 on a one-year simple interest installment loan at 18% interest. The monthly payments were $45.84. Find the amount of interest, amount applied to the principal, and the new balance for the first monthly payment.

SOLUTION

Calculate the monthly interest rate: $18\% \div 12 = 1.5\%$

Use $I = P \times R \times T$: $I = \$500 \times 0.015 \times 1 = \$7.50$

Subtract the interest from the monthly payment: $\$45.84 - \$7.50 = \$38.34$

Subtract the amount applied to principal from the previous balance.

$\$500.00 - \$38.34 = \$461.66$ new balance

Math *Tip*

Interest Formula:

$I = P \times R \times T$

I = *interest*

P = *principal*

R = *rate*

T = *time*

CHECK YOUR UNDERSTANDING

E. Benito Diaz borrowed $1,000 on a one-year simple interest installment loan at 15% interest. The monthly payments were $90.26. Find the amount of interest, amount applied to the principal, and the new balance for the first monthly payment.

F. Lillian Dish signed a $2,500, 6-month simple interest installment loan at 18% interest. The monthly payments were $438.81. Find the amount of interest, amount applied to the principal, and the new balance for the first two monthly payments.

NET Bookmark

Many lenders advertise their rates on the Internet. Access **www.cengage.com/school/business/businessmath** and click on the link for Chapter 5. Compare the interest rates to local lenders.

Wrap up

Darrel is going to have to borrow money to purchase a car. He can borrow the money from the auto dealer, buying the car on the installment plan. Or, he can borrow the money through an installment loan from another lender, such as a bank, credit union, or finance company. Since Darrel probably doesn't have other collateral for the loan, he will have to use the car he is buying as collateral. That means that if Darrel fails to make his loan payments, the lender can take back, or *repossess* the car.

TEAM Meeting

With two other students, investigate the borrowing terms of lenders for car loans. Check out the interest rates and monthly payments they would charge for a four-year, $15,000 auto loan. The lenders should include (a) an auto dealer, (b) a bank, (c) a credit union, and (d) a finance company.

Prepare a comparison chart that includes the following for each lender.

- interest rate
- monthly payments
- total payments
- finance charge

Exercises

Find the sum or difference.

1. $2,500 + $89.15
2. $159.95 + $12.28
3. $650 − $75
4. $1,079.34 − $418.73

Find the product or quotient.

5. $2,450 × 0.18
6. $389.67 × 2.5
7. $157 × 9
8. $4,584 ÷ 6
9. $81.60 ÷ $4,800
10. $1,000 ÷ 10

Find the installment price and finance charge for each item.

	Item	Cash Price	Installment Terms
11.	Digital Camera	$1,500	$100 down; $70.57 a mo. for 24 mos.
12.	Sleeper Sofa	$950	$50 down; $51.99 a mo. for 20 mos.
13.	Computer System	$2,150	$225 down; $228.40 a mo. for 9 mos.

Solve.

14. You buy a CD changer for a car's audio system for $25 down and a total installment price of $297.34. You pay $30.26 per month. For how many months will you have to make payments?

15. A novelty watch that sells for $60 cash may be bought for $6 down and $5.76 a month for 10 months. By what percent is the installment price greater than the cash price?

16. You can buy aluminum louvers for the rear window of your car for $180 cash or pay $45 down and the balance in 12 monthly payments of $13.50. By what percent would your installment price be greater than the cash price?

Find the monthly interest payment, amount applied to principal, and new balance for the first month for each simple interest installment loan.

	Amount Financed	Number of Payments	Monthly Payment	Annual Interest Rate
17.	$500	6	$87.02	15%
18.	$1,200	6	$207.06	12%
19.	$800	12	$73.34	18%

20. **CRITICAL THINKING** Look at the Loan Repayment Schedule chart. If the interest rate is 18% per year, why is the total of the interest payments less than $90, or $500 × 0.18?

A member of a credit union borrows $920 on a simple interest installment loan at 12% agreeing to repay it in 12 equal monthly payments of $81.74.

21. What was the total finance charge on the loan?

22. What was the interest paid for the first month?

23. What was the amount applied to principal at the end of the first month?

24. What was the new balance at the end of the first month?

Kay borrowed $400 from a finance company on a simple interest installment loan and repaid it in 6 monthly payments of $70.81. The finance charge rate was 21%.

25. What was the total finance charge on the loan?

26. What was the interest paid for the first month?

27. What was the amount applied to principal at the end of the first month?

28. What was the new balance at the end of the first month?

29. **FINANCIAL DECISION MAKING** You can buy a flat panel computer screen for $720 in cash or $50 down and 12 monthly payments of $63.47 on the installment plan from the dealer. You can also obtain a simple interest installment loan from another lender by signing a promissory note and using your car as collateral. The face of the note would be for $720 and would be payable, along with interest at 12%, one year later. If you do not have the cash but want the screen now, which loan would be the best for you? Why?

30. $43{,}109 \times 150$

31. $7{,}082 \div 1{,}000$

Mixed Review

32. $2\frac{2}{5} \times 5\frac{1}{8}$

33. $\$24 \times \frac{3}{4}$

34. $\frac{2}{5} + \frac{2}{3}$

35. What is $36\frac{1}{2}\%$ as a decimal?

36. Find the simple interest on \$2,812 for 1 month at 9% annually.

37. The town of Glen Gary charges its residents an income tax of $\frac{1}{2}\%$ of their taxable income. Julio Gonzalez lives in Glen Gary and has a taxable income of \$120,560. What is his income tax?

38. Sallie Woo worked these hours last week: Monday, 10; Tuesday, $8\frac{1}{4}$; Wednesday, $9\frac{1}{2}$; Thursday, 6; Friday, 8; Saturday, 5. Sallie is paid \$11.40 per hour for regular hours, time-and-a-half for overtime during the week, and double time for weekend hours. If Sallie works on an 8-hour day basis, what was her pay for the week?

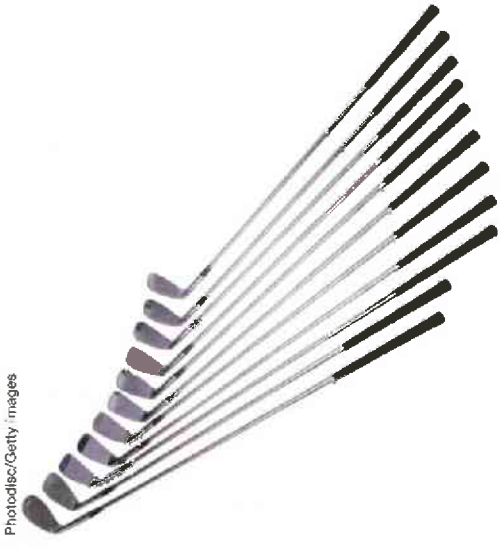
39. Tischa Fogoros' credit card statement for June showed no previous balance on June 1. A purchase of \$263.18 was posted on June 9, and a \$15.85 credit for returned merchandise has posted on June 17. Tischa's credit card company uses the average daily balance method to compute finance charges based on a 1.52% monthly APR. Find the finance charge for June and the new balance.

40. Luann Weber is paid a salary of \$520 a week and commission of 4.5% on all sales. Her sales last week were \$8,600. Find her total earnings for the week.

41. Tom Ridley invested \$10,000 in a certificate of deposit. He cashed the CD before the end of the certificate's term. The penalty for early withdrawal was 1 month's interest at 6% annual percentage rate. What was the amount of the penalty?

42. You have \$500 on deposit in a one-year certificate of deposit that pays 6% annual interest compounded quarterly. What is the effective annual interest rate, to the nearest tenth percent?

43. Ann Quinland bought a set of golf clubs on the installment plan for \$395. She paid \$45 down and the balance in equal monthly installments of \$25 each. How many months did it take Ann to pay for the set?



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5-4

Early Loan Repayments

GOALS

- Calculate the final payment to pay an installment loan off early
- Calculate the savings in interest to pay an installment loan off early

KEY TERM

- prepayment penalty

Start Up ▸▸▸

Eva Lewis borrowed $500 on a 12-month installment loan at 18% interest. After she made her first payment, she received a $600 bonus from work. She is trying to decide whether to use the bonus to pay off the loan early or to keep making the monthly payments. What should Eva consider to help her make her decision?

Digital Vision/Getty Images

Math Skill Builder

Review these math skills and solve the exercises that follow.

1 **Rewrite** percentages as decimals.
Rewrite 84% as a decimal. 84% = 0.84

1a. 52.9%

1b. 253%

1c. 0.6%

1d. 7.76%

2 **Subtract** dollar amounts.
Find the difference. $42,648.29 − $35,763.11 = $6,885.18

2a. $25,754 − $22,904

2b. $169.29 − $75.98

2c. $132.05 − $98.99

2d. $70,000 − $37,549

3 **Multiply** dollar amounts by whole numbers and decimals.
Find the product. $390.30 × 0.027 = $10.538, or $10.54

3a. $6,572 × 3

3b. $31,290 × 0.3

3c. $145 × 0.074

3d. $331 × 2.45

3e. $515 × 9

3f. $2.65 × 425

Early Loan Repayment

For simple interest installment loans, the monthly interest rate is applied to the unpaid balance of the loan. If you pay the loan off early, you simply pay the unpaid balance plus the current month's interest as the final payment. In some cases, there may be a **prepayment penalty**, which is a fee charged if you pay the loan off early. A prepayment penalty must be disclosed in the original terms of the loan.

EXAMPLE 1

Vern Goode took out a $5,000 simple interest loan at 6% interest for 24 months to buy a car. His monthly payment is $221.60. After making payments for 12 months, his balance is $2,574.79. He decides to pay the loan off with his next payment. How much will his final payment be?

SOLUTION

Find the interest due for the next month and add it to the balance. Calculate the monthly interest rate.

$6\% \div 12 = 0.5\% = 0.005$ monthly interest rate

Substitute known values in the interest formula

$I = \$2{,}574.79 \times 0.005 \times 1 = \$12.87$ $I = P \times R \times T$; $T = 1$ mo

Add the balance to the current month's interest:

$\$2{,}574.79 + 12.87 = \$2{,}587.66$ final payment

✔CHECK YOUR UNDERSTANDING

A. Mario Mineto had a 12-month, $2,000 simple interest loan at 9% interest. He repaid the loan in full with the sixth payment when his balance was $1,188.40. How much was his final payment?

B. Emily Polinkski repaid a 9-month, $3,000 installment loan at the end of 6 months. Her interest rate was 15%, and her balance was $1,374.82. How much was her final payment?

One reason to pay off an installment loan early is to pay less interest.

EXAMPLE 2

How much interest did Vern Goode (from Example 1) save by paying off his loan early?

SOLUTION

Calculate how much Vern would have paid if he had paid it on the payment schedule for all 24 months. Subtract the amount that Vern did pay.

Multiply the monthly payment amount by 24.

$\$221.60 \times 24 = \$5{,}318.40$ total that would be paid in 24 payments

Multiply the monthly payment amount by the number of payments Vern paid.

Business *Tip*

One way to evaluate whether to pay off a loan early is to consider the costs and benefits of paying off the loan versus investing the money and continuing to pay on the loan.

$\$221.60 \times 12 = \$2{,}659.20$ amount paid to date before final payment

Add the amount paid to the final payment.

$\$2{,}659.20 + \$2{,}587.66 = \$5{,}246.86$ total amount paid with early payoff

Subtract the amount Vern paid from the amount of scheduled payments.

$\$5{,}318.40 - \$5{,}246.86 = \$71.54$ amount of interest saved

✔ CHECK YOUR UNDERSTANDING

C. In Exercise A, Mario's monthly payment was \$174.90. How much interest will Mario save by paying off his loan with the sixth payment?

D. In Exercise B, Emily's monthly payment was \$354.51. How much interest will Emily save by paying off her loan in the sixth month?

Consumer Alert

Penalty for Prepayment

Before signing a loan document, you should read the terms of the loan and also ask questions. An important question to ask is if there is a prepayment penalty or if the loan is a Rule of 78 loan.

A prepayment penalty is a financial penalty for paying off the loan early. Prepayment penalties may be a set amount, a percentage of the loan or a certain number of months' interest. In a Rule of 78 loan, you pay more interest in the early months of the loan, so if you pay off the loan early you will have paid more in interest than with a simple interest loan. Rule of 78 loans are illegal in many states.

If you do not pay off the loan early, prepayment penalties and Rule of 78 loans will not increase the total amount that you pay. In some cases, you can get a better interest rate if you will agree to certain prepayment penalties. Before taking out a loan with prepayment penalties, consider your future plans and financial situation carefully.

Wrap Up ▸ ▸ ▸

Eva should consider how much she could save by paying off the loan early. She should find out if the loan has any prepayment penalties. She should consider the value of not having a monthly debt payment.

Exercises

Rewrite as a decimal.

1. 245.6%

2. 0.35%

Perform the indicated operation.

3. $\$4{,}208 - \$3{,}489$

4. $\$63{,}418.36 - \$48{,}897.57$

5. $\$189.87 \times 12$

6. $\$45.63 \times 3.148$

7. Rachel Carr has a 2-year, $4,000 car loan at 9%. After paying on the loan

for 18 months, Rachel has a balance of $1,068.22. She decides to pay off the loan with the next payment. How much will she have to pay for the final payment?

8. Terry O'Doole has a 4-year, $6,000 loan at 12%. After paying on the loan for 24 months, Terry has a balance of $3,356.52. He decides to pay off the loan with the next payment. How much will he have to pay for the final payment?

Lucy Smola borrowed $2,500 at 18% for 12 months. Her monthly payment is $229.20.

9. If Lucy makes the monthly payment for 12 months, how much will she pay back to the lender?

10. Lucy has the opportunity to pay off the loan with her fourth payment. Her current balance is $1,916.23. How much will she have to pay to pay off the loan?

11. How much did Lucy pay in total for the loan if she pays off the loan with her fourth payment?

12. How much will Lucy save if she pays off the loan early?

Levi Stein's 18-month, $6,500 loan has a 12% interest rate. His monthly payment is $396.38. After making payments for 9 months, the loan's balance is $3,395.43.

13. How much will Levi have to pay in order to pay off the loan with the next payment?

14. How much will Levi save if he pays off the loan early?

15. **FINANCIAL DECISION MAKING** Romero has a simple interest installment plan to pay for his computer. For his birthday, he receives a gift of money that is enough to pay off his installment loan. His friend encourages Romero to spend the money on other things and keep the loan on the computer. What would you advise Romero? Why?

16. **CRITICAL THINKING** Some lenders charge a prepayment penalty if you pay off a loan early. Why do you think some lenders do this?

Mixed Review

17. Round 29,458 to the nearest hundred.

18. Estimate the product of 34.56×24.8.

19. What is the average of $35.12, $36.20, $32.98, and $33.56?

20. The cash price of a large color TV was $2,400. Dee Hart bought it for $240 down and 12 monthly payments of $196. By what percent did the installment price exceed the cash price?

21. Sheila Wiggins' regular-time pay rate is $12.60 an hour, time-an-a-half for overtime, and double time for work on Saturdays and Sundays. What is her overtime rate? What is her double-time rate?

5-5

Annual Percentage Rates

GOAL
- Calculate the APR on a loan

KEY TERM
- annual percentage rate

Start Up

José is planning to get an installment loan for $2,000 for 12 months. One lender offers him a 13% interest rate. Another lender offers him a 10% interest rate with additional finance charges of $50. Which loan is the better deal?

Photodisc/Getty Images

Math Skill Builder

Review these math skills and solve the exercises that follow.

1. **Round** dollar amounts to the nearest cent.
Round $0.2978 to the nearest cent. $0.2978 = $0.30

1a. $3.985 **1b.** $2.0793

1c. $8.0049 **1d.** $0.455

2. **Multiply** dollar amounts by 10, 100, and 1,000.
Find the product. $489.43 × 100 = $48,943

2a. $189 × 100 **2b.** $208.97 × 1,000 **2c.** $790.72 × 10

3. **Divide** dollar amounts by dollar amounts to the nearest thousandth.
Find the quotient to the nearest thousandth. $500 ÷ $3,000 = 0.1666, or 0.167

3a. $420 ÷ $1,600 **3b.** $1,241 ÷ $8,560 **3c.** $2,445 ÷ $16,308

Annual Percentage Rate (APR)

Loans from different lenders can have very different rates, terms and fees. To evaluate and compare loans, you can use the **annual percentage rate**, the APR, which is the cost of credit for one year, expressed as a percentage.

To find the rate of interest on a single-payment loan for one year, you divide the interest paid in a year by the principal. Finding the rate of finance charges on an installment loan is not as easy. The cost of borrowing money may also include service charges. Also, since you make payments on the loan each month, you are not borrowing the whole principal for the full time of the loan.

The Truth in lending Act makes the lender tell the borrower what annual percentage rate (APR) is charged on the laon. The APR is usually higher than

the interest rate of your loan.

The easiest way to find the annual percentage rate is to use tables like the ones shown below. To use the tables, you need to know the number of monthly payments for the loan and the finance charge per $100 of the amount financed.

To find the *finance charge per $100* of the amount financed, divide the finance charge by the amount financed. Then multiply the quotient by 100.

$$\text{Finance Charge per \$100 of Amount Financed} = \frac{\text{Finance Charge}}{\text{Amount Financed}} \times \$100$$

After you have found the finance charge per $100, you can use the tables to find the annual percentage rate

Number of Payments	Annual Percentage Rate										
	12 3/4%	13%	13 1/4%	13 1/2%	13 3/4%	14%	14 1/4%	14 1/2%	14 3/4%	15%	15 1/4%
	Finance Charge per $100 of Amount Financed										
3	2.13	2.17	2.22	2.26	2.30	2.34	2.38	2.43	2.47	2.51	2.55
6	3.75	3.83	3.90	3.97	4.05	4.12	4.20	4.27	4.35	4.42	4.49
9	5.39	5.49	5.60	5.71	5.82	5.92	6.03	6.14	6.25	6.35	6.46
12	7.04	7.18	7.32	7.46	7.60	7.74	7.89	8.03	8.17	8.31	8.45
15	8.71	8.88	9.06	9.23	9.41	9.59	9.76	9.94	10.11	10.29	10.47
Number of Payments	**Annual Percentage Rate**										
	15 1/2%	15 3/4%	16%	16 1/4%	16 1/2%	16 3/4%	17%	17 1/4%	17 1/2%	17 3/4%	18%
	Finance Charge per $100 of Amount Financed										
6	4.57	4.64	4.72	4.79	4.87	4.94	5.02	5.09	5.17	5.24	5.32
12	8.59	8.74	8.88	9.02	9.16	9.30	9.45	9.59	9.73	9.87	10.02
Number of Payments	**Annual Percentage Rate**										
	18 1/4%	18 1/2%	18 3/4%	19%	19 1/4%	19 1/2%	19 3/4%	20%	20 1/4%	20 1/2%	20 3/4%
	Finance Charge per $100 of Amount Financed										
6	5.39	5.46	5.54	5.61	5.69	5.76	5.84	5.91	5.99	6.06	6.14
12	10.16	10.30	10.44	10.59	10.73	10.87	11.02	11.16	11.31	11.45	11.59

EXAMPLE 1

The finance charge for a 6-month, $1,200 installment loan is $72. Find the annual percentage rate on the loan.

SOLUTION

Divide the finance charge by the amount financed.

$\$72 \div \$1{,}200 = 0.06$

$0.06 \times \$100 = \$6$ Multiply the result by $100.

The finance charge per $100 of amount financed is $6.

Use the Annual Percentage Rate Tables. Read across the rows for 6 payments until you come to the amount closest to $6. Since $5.99 is the closest amount, use the rate, $20\frac{1}{4}\%$.

The annual percentage rate is $20\frac{1}{4}\%$.

Math *Tip*

When necessary, round the finance charge to the nearest cent.

✔ CHECK YOUR UNDERSTANDING

A. Melina Cavaletti borrowed \$800 on a loan with a finance charge of \$78. Find the finance charge per \$100 of the amount financed.

B. Chris Mathers borrowed \$250 on a 12-month loan that had a finance charge of \$20. Find the finance charge per \$100 of the amount financed and the annual percentage rate.

Wrap Up ▶ ▶ ▶

One way to evaluate the loans is to consider the APR. The monthly payment for the loan at 13% is \$178.63. He will pay back \$2,143.56, or \$143.56 in finance charges. The finance charge per \$100 of amount financed is \$7.18, or an APR of 13%. The monthly payment for the loan at 10% is \$175.83. Including the \$50 finance charge, he will pay back \$2,159.96, or \$159.96 in finance charges. The finance charge per \$100 of amount financed is \$8.00, or an APR of about $14\frac{1}{2}$%. Although the interest rate on the 13% loan is higher, the APR is lower. This means the cost of the credit per year is less than the loan with the 10% interest rate.

Financial Responsibility

Your Good Credit

Using credit cards and obtaining loans are very common practices to satisfy the desire to have something now. That debt does not come without risk or cost, however.

Consider some of the risks of buying on credit or with a loan:

- The item costs more because of the cost of interest.
- Payments may last longer than the pleasure you get from owning the item.
- Changes in your income can impact your ability to make timely payments.
- A cycle of debt can take months or years from which to recover.
- Falling behind on payments or defaulting on a loan will have a long-term impact on your ability to secure credit or a good interest rate in the future.

Chris is researching computer installment plans. The interest rate for the plans varies from 10%–29% depending on the credit score of the borrower. Below are three interest rates and the corresponding monthly payments for a 48-month installment plan to finance a \$1,500 computer.

10%: \$38.04 per month

19%: \$44.85 per month

29%: \$53.14 per month

Calculate the amount of interest paid over the life of the loan for each credit standing.

1. If Chris has good credit, he can get a 10% interest rate.
2. If Chris has average credit, he can get a 19% interest rate.
3. If Chris has poor credit, he can get a 29% interest rate.

Exercises

Round to the nearest cent.

1. $4.5627
2. $105.3978

Find the product.

3. $98,208 × 100
4. $389.74 × 1,000
5. $1,078.43 × 10
6. $38.95 × 100

Find the quotient to the nearest thousandth.

7. $186 ÷ $828
8. $482 ÷ $4,298.18
9. $384 ÷ $605
10. $78 ÷ $152.98

Find each finance charge per $100.

11. A loan of $3,200 with a finance charge of $480
12. A loan of $12,600 with a finance charge of $1,638

Find the annual percentage rate for the following loans.

13. Finance charge of $5.75 per $100 for 9 payments.
14. Finance charge of $2.50 per $100 for 3 payments.
15. Finance charge of $8.85 per $100 for 15 payments.
16. Finance charge of $23.55 per $500 for 6 payments.
17. Finance charges of $19.13 per $750 for 3 payments.
18. **CRITICAL THINKING** What specific pieces of information should you look for in any loan contract? Why is this information important?

You borrow $2,600 and repay the loan in 12 monthly installments of $232.

19. What was the finance charge on your loan?
20. What was the finance charge per $100 of the amount financed?
21. What was the annual percentage rate?

Olga Pozinski borrowed $1,300 and repaid it in 12 monthly payments of $116.

22. What was the finance charge on the loan?
23. What was the finance charge per $100 of amount financed?
24. What was the annual percentage rate?

Find the APR on each loan.

25. Charles repaid a loan of $1,600 in 15 monthly installments of $116.40 each.
26. Kieran repaid a loan of $900 in 6 monthly installments of $157.98 each.
27. Nyla repaid a loan of $2,500 in 12 monthly installments of $224.77.
28. Sule repaid a loan of $1,750 in 12 monthly payments of $160.85.
29. Vega repaid a loan $4,250 in 15 monthly installments of $348.8 each.
30. Thai repaid a loan of $1,125 in 9 monthly payments of $131.90 each.

INTEGRATING YOUR KNOWLEDGE Violeta Ramos is considering financing $4,000 of electronic equipment on a simple interest installment loan. She would make 12 monthly payments of $360.

31. Find the total amount Violeta will pay over the life of the loan.

32. How much interest will Violeta pay?

33. What is the finance charge per $100 of amount financed?

34. What is the annual percentage rate?

35. Violeta goes to a bank and is offered one year promissory note for 8%. How much interest will she pay on the note? How does this compare to the interest charges on the installment loan?

Mixed Review

36. $\$788 \times 100 =$

37. $\$9.75 \times 1{,}000 =$

38. $\$10.78 \times 10 =$

39. $\$3.97 \times 100 =$

40. Write $\frac{1}{4}$ as a ratio.

41. Rewrite $12\frac{5}{8}$ as a percent.

42. On January 31, Edith Nagel's bank statement balance was $516.24. Her check register showed that a deposit for $382.10 was outstanding. The following checks were also outstanding: #108, $45.93; #109, $108.12; #111, $6.87. What was the corrected bank statement balance?

43. Rhonda Peterson pays a city tax of 1.5% on her taxable income. She also pays a state tax of 3.25% on her taxable income. What total city and state income taxes does she pay if her taxable income is $38,109?

44. Hector Vadillo is a waiter and had these total checks for the week: Tuesday, $245.19; Wednesday, $299.74; Thursday, $349.73; Friday, $612.50; and Saturday, $575.33. If Hector received an average of 15% for tips during the week, how much money did he receive in tips?

Photodisc/Getty Images

45. Find the exact interest on $1,050 at 14% for 126 days.

Cory Mathis is married with 4 withholding allowances. Each week his employer deducts $18 in federal withholding taxes, 6.2% in Social Security taxes, 1.45% in Medicare taxes, and $58.77 for health insurance from his gross pay. His gross weekly wage is $609.

46. Find the total deductions.

47. Find his net pay.

48. Faye Rivera worked these hours last week: Monday, 8 hours; Tuesday, 6 hours; Wednesday, 7 hours; Thursday, 8 hours; and Friday, 7 hours. If she is paid $12 an hour, what was Faye's gross pay for the week?

49. Tyrone Wilson's yearly pay for the last three years was: $24,800, $25,900, and $29,760. What was Tyrone's average yearly pay?

Vocabulary Review

Find the term, from the list at the right, that completes each sentence. Use each term only once.

annual percentage rate
daily interest factor
down payment
exact interest method
finance charge
interest
ordinary interest method
prepayment penalty
principal
promissory note
rate of interest
total amount due

1. A way to find interest that uses a 365-day year is the __?__.
2. The __?__ tells you how much interest a note is accumulating per day.
3. Interest, fees, and other charges paid on an installment loan or purchase is the __?__.
4. The true rate of interest on an installment loan is called __?__.
5. The principal of a loan and the interest on the loan is the __?__.
6. A financial penalty for paying a loan off early is a(n) __?__.
7. The amount charged for the use of money is called __?__.
8. The amount that is borrowed is called the __?__.
9. The __?__ is the part of the purchase price of an item that is paid at the time you take out a loan.
10. When you sign a(n) __?__, you are giving a lender a written promise you will repay the money that you have borrowed.

5-1 Promissory Notes

11. How much interest will you for a 18-month promissory note that has a principal of $3,200 and a rate of 7.875%?
12. What is the amount due at maturity for the loan in Question 11?
13. Phyllis Snow borrowed $3,200 to pay for a new roof. She signed a 6-month promissory note at 12% interest. Find the amount of interest Phyllis must pay. Then find the amount she must repay to her bank when the note comes due.
14. Oki Saga signed a promissory note for $1,500 at 8% interest for 90 days. Find the interest and amount due she will pay when the note is due using a) ordinary interest and b) exact interest.
15. Mohamed Jatmiko paid $420 in interest on a 6-month note for $5,600. Find the rate of interest he paid.
16. Brandon Jones paid $305.25 in interest on a 2-year note for $1,850. Find the rate of interest paid.

5-2 Calculating Interest

17. Use the simple interest table to find the exact interest on: a) $470 for 10 days at 9%; b) $470 for 40 days at 10%.

18. What is the daily interest factor for $1,250 borrowed at 13.5% exact interest?

19. Find the ordinary interest from March 5 to May 12 on $5,500 at 8% interest.

20. Find the exact interest from June 13 to August 15 on $6,200 at 9%.

21. Find the interest from March 15 to May 31 on $1,900 at 10%.

5-3 Installment Loans

22. You can buy a DVD player for $250 cash or pay $50 down and the balance in 12 monthly payments of $18. What is the installment price? By what percent would your installment price be greater than the cash price?

23. A stove costs $525 on the installment plan. You must make a down payment of $75 and make payments for 15 months. What will be your monthly payments?

24. Hector Morales borrowed $2,400 on a one-year simple interest installment loan at 12% interest. The monthly payments were $213.24. Find the amount of interest, amount applied to the principal, and the new balance for the first monthly payment.

25. Find the installment price and the finance charge that Harold paid for a $1,200 television because he paid $95 down and $78.85 a month for 18 months.

5-4 Early Loan Repayments

26. Terrence Moore has a 4-year, $9,500 car loan at 8%. After paying on the loan for 36 months, he has a balance of $2,666.13. He decides to pay off the loan with the next payment. How much will he have to pay?

27. Gaby Frazier has a 1-year, $2,200 loan at 10%. After paying on the loan for 4 months, Gaby has a balance of $1,490.87. She decides to pay off the loan with the next payment. How much will she have to pay?

28. Penn Peloko borrowed $10,500 at 8.5% for 5 years. His monthly payment was $215.42. Penn did not pay off the loan early. How much did he pay back to the lender?

5-5 Annual Percentage Rates

29. Maria Medina borrowed $400 on a 12-month loan with a finance charge of $39. Find the finance charge per $100 of the amount financed and the annual percentage rate.

30. Find the annual percentage rate for a loan with a finance charge of $6.25 per $100 for 9 payments.

31. Calida repaid a loan of $2,100 in 15 monthly installments of $152.40 each. Find the APR on her loan.

32. Find the annual percentage rate for a loan with a finance charge of $40.20 per $500 for 12 payments.

33. Pedro repaid a loan $3,900 in 15 monthly installments of $284 each. Find the APR on his loan.

Task 1 Payments of a Loan

Complete a template that calculates balances after each loan payment to show interest paid and remaining balance due. Then analyze the impact of applying additional money to the principal each month.

Open the spreadsheet for Chapter 5 (tech5-1.xls) and enter the data shown in blue (cells C1, C3 and B7) into the spreadsheet. The value you enter in cell C3 is the interest rate on the loan. The amount of the loan is the value you enter in cell C1. The monthly loan payment is the amount you enter in cell B7. Note that only 30 of the 60 months needed to pay off the loan is shown in the spreadsheet.

The spreadsheet will calculate the:

1. amount of interest paid for the month
2. amount of the payment applied to the principal each payment
3. remaining balance after each payment
4. total interest paid
5. total amount of interest paid
6. total amount of principal paid

	A	B	C	D	E	F
1	Loan amount		$17,500.00			
2	Length of loan		5 years			
3	Interest rate		5.50%			
4	Month	Loan Payment	Interest	Principal	Additional	Loan Balance
6						$ 17,500.00
7	1	$ 334.27	$ 80.21	$ 254.06	$ –	$ 17,245.94
8	2	$ 334.27	$ 79.04	$ 255.23	$ –	$ 16,990.71
9	3	$ 334.27	$ 77.87	$ 256.40	$ –	$ 16,734.32
10	4	$ 334.27	$ 76.70	$ 257.57	$ –	$ 16,476.75
11	5	$ 334.27	$ 75.52	$ 258.75	$ –	$ 16,217.99
12	6	$ 334.27	$ 74.33	$ 259.94	$ –	$ 15,958.06
13	7	$ 334.27	$ 73.14	$ 261.13	$ –	$ 15,696.93
14	8	$ 334.27	$ 71.94	$ 262.33	$ –	$ 15,434.60
15	9	$ 334.27	$ 70.74	$ 263.53	$ –	$ 15,171.07
16	10	$ 334.27	$ 69.53	$ 264.74	$ –	$ 14,906.34
17	11	$ 334.27	$ 68.32	$ 265.95	$ –	$ 14,640.39
18	12	$ 334.27	$ 67.10	$ 267.17	$ –	$ 14,373.22
19	13	$ 334.27	$ 65.88	$ 268.39	$ –	$ 14,104.83
20	14	$ 334.27	$ 64.65	$ 269.62	$ –	$ 13,835.20
21	15	$ 334.27	$ 63.41	$ 270.86	$ –	$ 13,564.35
22	16	$ 334.27	$ 62.17	$ 272.10	$ –	$ 13,292.25
23	17	$ 334.27	$ 60.92	$ 273.35	$ –	$ 13,018.90
24	18	$ 334.27	$ 59.67	$ 274.60	$ –	$ 12,744.30
25	19	$ 334.27	$ 58.41	$ 275.86	$ –	$ 12,468.44
26	20	$ 334.27	$ 57.15	$ 277.12	$ –	$ 12,191.32
27	21	$ 334.27	$ 55.88	$ 278.39	$ –	$ 11,912.92
28	22	$ 334.27	$ 54.60	$ 279.67	$ –	$ 11,633.25
29	23	$ 334.27	$ 53.32	$ 280.95	$ –	$ 11,352.30
30	24	$ 334.27	$ 52.03	$ 282.24	$ –	$ 11,070.07
31	25	$ 334.27	$ 50.74	$ 283.53	$ –	$ 10,786.53
32	26	$ 334.27	$ 49.44	$ 284.83	$ –	$ 10,501.70
33	27	$ 334.27	$ 48.13	$ 286.14	$ –	$ 10,215.56
34	28	$ 334.27	$ 46.82	$ 287.45	$ –	$ 9,928.12
35	29	$ 334.27	$ 45.50	$ 288.77	$ –	$ 9,639.35
36	30	$ 334.27	$ 44.18	$ 290.09	$ –	$ 9,349.26
38	Totals		$ 1,877.36	$ 8,150.74	$ –	

Task 2 Analyze the Spreadsheet for Early Loan Pay Off

If you wanted to pay off the loan early and save money paid as interest, you can pay additional money each month that will be applied directly to the principal.

Enter an amount in cell E7. Use the Fill Down feature to duplicate that amount in each row. Try entering different amounts in that cell to see how much interest and time you can save paying on this loan.

Answer these questions about your spreadsheet.

1. What is being multiplied to find the interest in Column C?
2. How is the amount in the Principal column calculated?
3. After the 30th loan payment how much of the principal is still due without paying any additional money each month?
4. How much interest has already been paid to the bank?
5. If $100 additional money was paid each month, what would be the loan balance after the 30th payment?
6. How much less interest would have been paid?
7. About how much additional money (rounded to the nearest $10) would you have to pay each month to get the loan paid off in 30 months instead of 60 months? How much interest will have been saved?

Task 3 Design a Spreadsheet to Pay Off a Loan Early

You are to design a spreadsheet that will calculate the amount of your monthly payment that is interest and the amount applied to the principal, so that you can determine the additional amount needed to pay off a loan early.

SITUATION: Your monthly payment is $198.85 for a $6,500 loan you have taken out at a rate of 6.375% for 3 years. You want to know the additional amount you can pay each month so that you can pay the loan off in 2 years.

Task 4 Analyze the Spreadsheet for Early Loan Pay Off

Enter an amount in cell E7. Use the Fill Down feature to duplicate that amount in each row. Try entering different amount in that cell to see how much interest and time you can save paying on this loan.

Answer these questions about your spreadsheet.

1. Enter an amount in your additional column cells. Based on the balance of the loan in the row for the 24th month, should increase or decrease the additional amount.
2. What additional amount (rounded to the nearest $10) will allow you to pay off the loan in two years?
3. How much interest will you save?

Chapter Test

Chapter Assessment

Answer each question.

1. Rewrite 0.06% as a decimal.
2. Rewrite $7\frac{1}{4}\%$ as a decimal.
3. Multiply: \$540 × 3.5%
4. Multiply: \$398.77 × 0.000673.
5. Multiply: \$426 × 0.057%
6. Find what percent \$35 is of \$140.
7. Divide: 720.15 ÷ 100.
8. Divide: \$2,400 ÷ 48.
9. Add: \$209.34 + \$345.12
10. Find the number of days between January 4 and January 23.

Solve.
Use the Simple Interest Table on page 179 to find the interest to the nearest cent.

11. \$5,600 at 10.5% from 2/10 to 2/28
12. \$950 at 12% from 11/1 to 12/31
13. Cora Fear borrowed \$1,500 for 18 months from her bank. Cora signed a promissory note that carried 15% interest. Find the amount of interest Cora must pay. Then find the amount she must repay to her bank on the due date.
14. Ted Nash must pay \$1,600 in interest on a promissory note for \$40,000 due 4 months from the date of the note. Find the rate of interest he will pay.
15. You can buy a product for \$750 cash or pay \$150 down and the balance in 12 monthly payments of \$61.25. What is the installment price? By what percent would your installment price be greater than the cash price?
16. Don Crawitz borrowed \$780 on a loan with a finance charge of \$68. Find the finance charge per \$100 of the amount financed.
17. What is the daily interest factor for \$3,450 borrowed at 9.5% exact interest?
18. Brenda Vowlski has a 2-year, \$2,500 car loan at 9%. After paying on the loan for 3 months, Brenda has a balance of \$2,211.46. She decides to pay off the loan with the next payment. How much will she have to pay?
19. Thane Davis has a 3-year, \$5,200 loan at 7.5%. After paying on the loan for 15 months, he has a balance of \$1,411.31. He decides to pay off the loan with the next payment. How much will he have to pay?
20. Revi repaid a loan \$1,450 in 12 monthly installments of \$132.75 each. Find the APR on his loan.

Use the APR table for Questions 21 and 22.

21. Find the interest from June 14 to August 10 on \$975 at 8.5%.
22. Zoe Lendon borrowed \$3,800 and repaid it in 15 monthly payments of \$275.50. How much did she pay in finance charges on the loan? What was the annual percentage rate?

Planning a Career in Finance

Careers in finance involve working with numbers. A loan officer, financial advisor, or insurance claims adjuster works closely with the public. Other careers in finance, such as insurance underwriter, some types of accountants and budget analysts have little contact with the public. Workers who have a strong aptitude for working with numbers thrive in the banking, accounting, financial, and business industries. If you enjoy math and want to turn it into a successful career, a job in finance might be the career path for you.

Job Titles

- Financial clerk
- Accountant
- Tax auditor
- Technical writer
- Loan underwriter
- Insurance claims adjuster
- Economist
- Bank manager
- Financial advisor

Needed Skills

- very detail oriented
- excellent mathematical ability
- computer and technology skills
- honesty

- ability to work and make decisions independently
- excellent communication skills with clients and coworkers
- outstanding analytical and problem solving skills
- understand and maintain confidentially

What's it like to work in Finance

Loan officers generally work in financial institutions like banks, credit unions, or savings and loans. Loan officers often specialize in the types of loans they service; consumer loans, mortgages, or commercial loans. A loan officer will guide the client through the loan process, explain the process and types of loans available, request appropriate information, answer questions, and assist with applications. A loan officer can analyze a prospective client's credit worthiness and can sometimes assist to improve chances of being approved for a loan.

What About You?

In the finance industry, where can you see yourself in the future? Would you like a job with customer contact, or a job behind the scenes?

How Times Have Changed

For the following questions, refer to the timeline on page 169 as needed.

1. What was the difference in U.S. prime interest rate at the end of 1980 to the end of 2001?
2. What was the range of rates U.S. consumers likely paid for loans in December 2008?
3. In December of 2008, on a simple interest loan of $5,000 for one year, what was likely the least interest amount paid by a typical U.S. bank customer? the greatest interest amount paid? How does that compare to the interest that would have been paid in 1980?

Chapter 6

Own a Home or Car

Statistical Insights

Most Popular Colors of Vehicles in North America

Source: www2.dupont.com

Use the data shown above to answer each question.

1. What color is favored among truck and SUV owners?
2. If you were the person responsible for placing the order for the compact and sports cars that are to be sold from a dealer's lot, what three car colors would you order most?
3. What color is among the top three favored colors for all vehicles?
4. Fifteen black vehicles in each category are ordered and arrive at a dealer's lot on the same day. Assuming each type of vehicle sells at about the same rate, which type of black vehicle would sell out first? Which type of black vehicle would sell out last?

How Times Have Changed

The percentage of American households that own homes is the homeownership rate. At the beginning of the 20th century, this rate was below 50%. By the end of the century, the homeownership rate was above 67%. The greatest annual drop of the homeownership rate ever recorded was in the year 2007.

1900

1910 The homeownership rate is 45.9%.

1920

1929 The Great Depression begins. The housing finance system eventually collapses with $10 billion of mortgage debt in default.

1940 **1940** The homeownership rate is 43.6%.

1945 World War II ends. Low-interest 30-year mortgages ignite a homeownership boom.

1950 The homeownership rate is 55.0%.

1960

1970 The homeownership rate is 62.9%.

1980 **1980** The homeownership rate is 64.4%.

2000 **2003** The homeownership rate is 68.3%.

Research to find the homeownership rate in January 2007.

2020

NETBookmark

The U.S. Department of Housing and Urban Development web site provides information about buying a home. Access **www.cengage.com/school/business/businessmath** and click the link for Chapter 6. What are the nine steps to buying a home? Find out about home buying programs in your state.

6-1

Borrowing to Buy a Home

GOALS

- Calculate the down payment, closing costs, and mortgage loan amount
- Calculate the total interest cost of a mortgage loan
- Calculate the savings from refinancing mortgages

KEY TERMS

- down payment
- mortgage loan
- principal
- closing costs

Start Up ▶ ▶ ▶

A home located near a school bus parking lot may cost less to buy than a similar home located several blocks away. Why might this be true?

Photodisc/Getty Images

Math Skill Builder

Review these math skills. Solve the exercises.

1 **Add** money amounts.
Find the sum. $\$127 + \$258 + \$98 = \$483$

1a. $\$956 + \$32 + \$128$ **1b.** $\$125 + \$85 + \$275$

2 **Multiply** whole numbers.
Find the product. $20 \times 12 = 240$

2a. 30×12 **2b.** 25×12

2c. 120×12 **2d.** 60×12

3 **Multiply** money amounts by whole numbers and percents.
Find the product. $240 \times \$416.70 = \$100{,}008$
Find the product. $15\% \times \$49{,}000 = 0.15 \times \$49{,}000 = \$7{,}350$

3a. $300 \times \$316.98$ **3b.** $360 \times \$501.05$

3c. $20\% \times \$115{,}800$ **3d.** $25\% \times \$78{,}200$

4 **Subtract** money amounts.
Find the difference. $\$95{,}600 - \$42{,}000 = \$53{,}600$

4a. $\$106{,}892 - \$41{,}985$ **4b.** $\$3{,}582 - \$1{,}284.34$

Down Payments and Closing Costs

The total cost of buying a home includes the purchase price, the cost of borrowing money for the purchase, and closing costs.

Feverpitch/Shutterstock.com

Most people make a cash **down payment**, or a percentage of the total cost of the house paid at the time of purchase, to their lender. Some lenders require no down payment; others ask for as much as 30%. The more money you can put as a down payment, the less you need to borrow.

The balance of the purchase price (after the down payment) is usually borrowed through a **mortgage loan** taken with a bank or other lender. The money borrowed is called the **principal**. Interest must be paid on the mortgage loan. A mortgage gives the lender the right to take the property if the loan is not repaid as agreed. The length and terms of mortgages vary; 15-, 20-, and 30-year mortgages are common.

Closing costs are fees and expenses paid to complete the transfer of ownership of a home. Closing costs may range from 3% to 6% of the purchase price of the home. Typical closing costs include legal fees, recording fees, title insurance, loan application fees, appraisal and inspection fees, land surveys, prepaid taxes, and prepaid interest charges known as *points*. Interest rates and closing costs vary among lenders, so it pays to compare when you are looking for a lender.

To calculate the amount of the loan you need, subtract the down payment from the purchase price.

Mortgage Loan = Purchase Price − Down Payment

To calculate the amount of money you need to buy a home, add the down payment and the closing costs.

Cash Needed to Buy a Home = Down Payment + Closing Costs

Business *Tip*

At the time you pay the down payment and closing costs, you must also provide proof that you have insured the property, which is another cost of buying and owning a home.

Consumer Alert

Always Get a Good Faith Estimate

Within three days of applying for a mortgage, the lender must provide a Good Faith Estimate, which is an itemized list of the fees and costs associated with the loan. The Good Faith Estimate document is a way you can compare mortgages from different lenders. Be aware, though, that the Good Faith Estimate is an estimate, and actual costs can vary.

EXAMPLE 1

Hilda Mikon is buying a home for $74,000. She will make a 20% down payment and estimates closing costs as:

legal fees	$950
title insurance	$140
property survey	$250
inspection	$175
loan processing fee	$ 84
recording fee	$740

What amount of money will she need to borrow for her mortgage loan? What amount of cash will she need when she buys the house?

SOLUTION

Multiply the purchase price by the down payment percent.

$20\% \times \$74{,}000 = 0.2 \times \$74{,}000 = \$14{,}800$ amount of down payment

Subtract the down payment from the purchase price.

$\$74{,}000 - \$14{,}800 = \$59{,}200$ amount of mortgage loan

Add the closing costs to find their total.

$\$950 + \$140 + \$250 + \$175 + \$84 + \$740 = \$2{,}339$ total closing costs

Add the down payment and the total closing costs.

$\$14{,}800 + \$2{,}339 = \$17{,}139$ cash needed to buy house

✔ CHECK YOUR UNDERSTANDING

A. Ricky Alberts' lender requires him to make a 25% down payment to get a mortgage on a home that costs $86,000. What amount will Ricky have to borrow to purchase the home?

B. Terri Wilburn will be able to purchase a condominium by making a 5% down payment on its $64,000 purchase price. She estimates her closing costs to be 3.5% of the purchase price. What amount of money will Terri need to pay the down payment and closing costs?

Math *Tip*

When you multiply a number by two different percents, you may add the percents and do one multiplication to find the answer.

Mortgage Loan Interest Costs

There are many different types of mortgages. Two of the most common types are fixed rate mortgages and variable rate mortgages. With *a fixed rate mortgage*, the same rate of interest is paid for the life of the loan. With a *variable rate mortgage*, the rate of interest is not guaranteed and may be increased or decreased.

Most mortgages are repaid gradually, or *amortized*, over the life of the mortgage in equal monthly payments. Each payment pays off part of the principal plus the interest due each month.

At first, most of the monthly payment goes to pay interest. As time passes, the amount that goes to repay the principal increases. The following table shows the amounts of interest and principal paid in different months on a 30-year, $70,000 loan at 9.75% interest. The monthly payment is $601.41.

	Month In Which Payment Is Made		
Payment Breakdown	**No. 1**	**No. 180**	**No. 358**
Interest	$568.75	$462.39	$14.42
Principal	$ 32.66	$139.02	$586.98
Total Payment	$601.41	$601.41	$601.41

Most lenders allow customers to make additional payments toward the principal so the mortgage can be paid off earlier. These added payments reduce the total interest paid.

The amortization table below shows the monthly payments needed to amortize mortgage loans over different periods of time using interest rates of 6%, 7%, and 8%.

To use the table to find a monthly payment, locate the box where the interest rate, the term of the loan, and the amount of the loan cross, or intersect.

Photodisc/Getty Images

AMORTIZATION TABLE

MONTHLY PAYMENTS NEEDED TO PAY A LOAN

Dollar Amount of Loan	Interest Rate								
	6.00%			7.00%			8.00%		
	Term of Loan								
	20 yrs	25 yrs	30 yrs	20 yrs	25 yrs	30 yrs	20 yrs	25 yrs	30 yrs
$ 40,000	$286.57	$257.72	$239.82	$310.12	$282.71	$266.12	$334.58	$308.73	$293.51
45,000	322.39	289.94	269.80	348.88	318.05	299.39	376.40	347.32	330.19
50,000	358.22	322.15	299.78	387.65	353.39	332.65	418.22	385.91	366.88
60,000	429.86	386.58	359.73	465.18	424.07	399.18	501.86	463.09	440.26
70,000	501.50	451.01	419.69	542.71	494.75	465.71	585.51	540.27	513.64
80,000	573.14	515.44	479.64	620.24	565.42	532.24	669.15	617.45	587.01
90,000	644.79	579.87	539.60	697.77	636.10	598.77	752.80	694.63	660.39
100,000	716.43	644.30	599.55	775.30	706.78	665.30	836.44	771.82	733.76
110,000	788.07	708.73	659.51	852.83	777.46	731.83	920.08	849.00	807.14

EXAMPLE 2

Amira Okano wants to buy a home that costs $83,000. She has $13,000 for the down payment, and her bank will lend her $70,000 on a 25-year, 8% mortgage. Find Amira's monthly payments and the total amount of interest she would pay over the term of the mortgage.

SOLUTION

On the $70,000 line of the amortization table in the 25-year column under 8% is the amount $540.27, the monthly payment.

Multiply the number of months in a year by the number of years in the loan to find the total number of months the loan will last.

$25 \times 12 = 300$ months

Multiply the number of months in the loan by the monthly payment to find the total amount needed to pay off the loan over 25 years.

$300 \times \$540.27 = \$162{,}081$ total payments

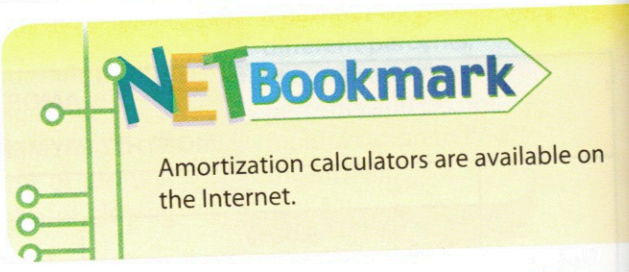
Subtract the amount of the mortgage from the total monthly payments to find the total interest paid over 25 years.

$$\begin{array}{rl} \$162{,}081 & \text{total payments} \\ -\$\ 70{,}000 & \text{amount of mortgage} \\ \hline \$\ 92{,}081 & \text{interest paid over the 25-year period} \end{array}$$

✔CHECK YOUR UNDERSTANDING

C. Marvin Zack bought a home for $95,000 with a $15,000 down payment. His mortgage is for 20 years at 7%. Find Marvin's monthly payments and the total amount he will pay in interest over the 20-year loan period.

D. Joseph and Rhoda Flynn bought a modular home as a future retirement home. The Flynns made a $25,000 down payment and got a $40,000 loan to pay for the home. If the loan is for 25 years at 6%, what monthly payment will they make? What total interest will they pay on the loan over the 25 years?



Refinancing a Mortgage

When interest rates go down, business firms and property owners may refinance or replace their fixed or variable rate mortgages with another mortgage at a lower interest rate.

When you refinance a mortgage, you take out a new mortgage and use that money to pay off the old mortgage. When you refinance your mortgage, you also pay closing costs on the new loan. There may also be other fees, such as the application costs for a loan or a prepayment penalty charged for paying off the first mortgage before it is due.

Business *Tip*

Due to loan costs, the savings in the first year is small. Finding the difference between loans over several years will show the total savings of refinancing.

EXAMPLE 3

The Rowes had a fixed rate mortgage at 9.65% with an unpaid balance of $40,000. The monthly payment on the old mortgage was $511.09. They got a new mortgage at 7.98% for the amount of the unpaid balance from another lender. Their new monthly payment is $340.73.

To get the new mortgage, they had to pay closing costs of $935. To pay off the old mortgage before it was due, they had to pay a prepayment penalty of $500. How much did they save during the first year by getting the new mortgage?

SOLUTION

Multiply the old monthly payment by the number of months in a year.

$12 \times \$511.09 = \$6{,}133.08$ one year's payment under old mortgage

Multiply the new monthly payment by the number of months in a year.

$12 \times \$340.73 = \$4{,}088.76$ one year's payment under new mortgage

$\$6{,}133.08 - \$4{,}088.76 = \$2{,}044.32$ difference in yearly payments

$\$935 + \$500 = \$1{,}435$ total of closing costs and prepayment penalty

$\$2{,}044.32 - \$1{,}435 = \$609.32$ amount saved in first year

✔ CHECK YOUR UNDERSTANDING

E. Nancy Ouimet's monthly mortgage payment is $597. She can refinance her loan with a new mortgage with monthly payments of $465. The total cost of getting a new mortgage is $836. What net first-year savings will she have with the new mortgage?

F. Will Ryan can refinance a mortgage by paying $716 in closing costs and $485 for a prepayment charge. His current monthly mortgage payment is $982. The monthly payment for the refinanced mortgage will be $876. If he refinances the mortgage, how much will he save in the first year?

Wrap Up ▶ ▶ ▶

The location of property is usually the most important factor in determining its value. The increased traffic, the exhaust odors, and the noise may make the home near the parking lot less desirable.

Exercises

Find the sum.

1. $\$128 + \$65 + \$902$

2. $\$3{,}404 + \$1{,}783$

Find the product.

3. 12×15

4. 12×40

5. $12 \times \$653.87$

6. $180 \times \$326.85$

7. $20\% \times \$184{,}600$

8. $2.5\% \times \$78{,}400$

Find the difference.

9. $\$145{,}874 - \$60{,}000$

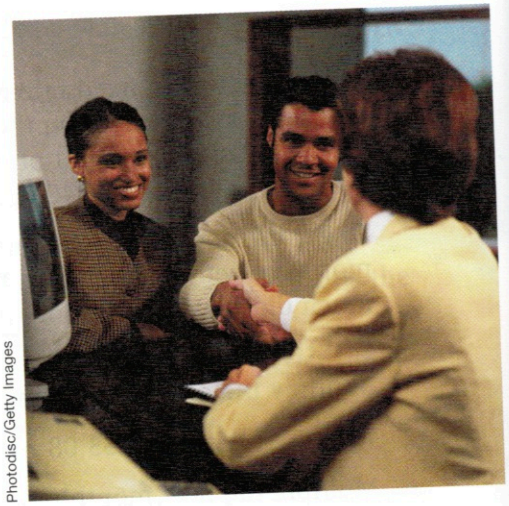
10. $\$4{,}329.34 - \$2{,}508.85$

The Colburns want to buy a condominium priced at $135,700. They will need to make a down payment of 15% and pay closing costs of 3% of the purchase price.

11. How much cash will they need for the down payment?

12. How much of the purchase price will they have to borrow?

13. How much cash will they need for the closing costs?



Photodisc/Getty Images

Ethel and Hector Ward bought a house at its market value of $82,000. They made a 5% down payment and paid these closing costs: legal fees, $550; property survey, $310; title insurance, $275; inspection fees, $240; points, $1,558.

14. What was the amount of the down payment?

15. What was the total of the closing costs?

16. How much of the purchase price will they have to borrow?

17. How much cash will they need to pay the down payment and closing costs?

Use the loan amortization table to help solve problems 18–23.

	Loan Amount	Interest Rate	Loan Term	Monthly Payment	Total Interest Paid Over Loan Term
18.	$45,000	6%	30 yrs		
19.	$60,000	8%	20 yrs		
20.	$110,000	7%	25 yrs		
21.	$90,000	7%	30 yrs		
22.	$50,000	6%	20 yrs		
23.	$100,000	8%	30 yrs		

Your old $47,000, 30-year, 12.8% mortgage has a monthly payment of $512.58. Over the 6 years since you took out the loan, mortgage rates have dropped. You can now get a mortgage at 9.05%, which will result in a new monthly payment of $369.36. To refinance, you must pay $1,020 in closing costs and a $480 prepayment penalty.

24. Find the net amount you will save in the first year.

25. Find the net amount you will save in the second year.

26. After being in effect for 4 years, the rate of interest on Syd Mutin's variable rate mortgage increased to 6.48% from 4.7%. Syd's old monthly payment was $259.32. His new monthly payment is $327.18. How much more will Syd pay in one year at the new mortgage rate?

27. **FINANCIAL DECISION MAKING** What do you think are the advantages and disadvantages of low down payments and long-term loans?

28. **CRITICAL THINKING** When do you think that refinancing a mortgage may not be a good idea?

Mixed Review

29.
$$\begin{array}{r} \$\ 78{,}412.23 \\ \$129{,}808.49 \\ +\ \$\quad 3{,}642.01 \\ \hline \end{array}$$

30. $\$283{,}371 - \$127{,}319$

31. Round to the nearest hundred: 5,565.17

32. Write $12\frac{1}{2}\%$ as a decimal.

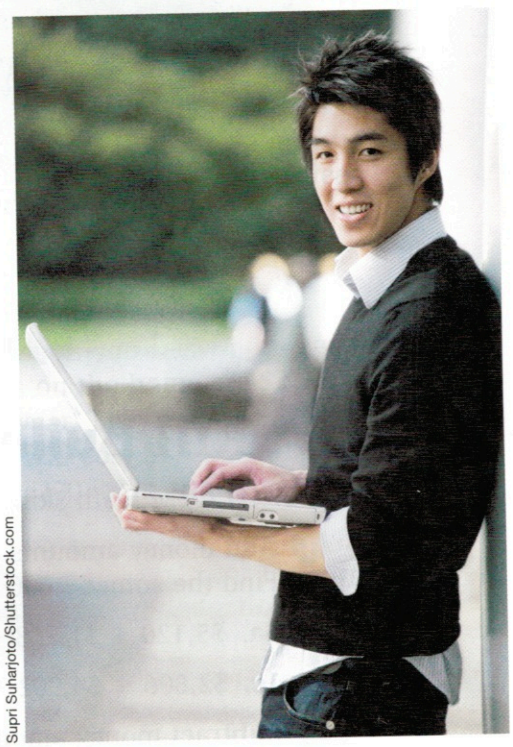
33. $2\frac{1}{8} + 3\frac{3}{8}$

34. A laptop computer has a cash price of \$1,800. To buy it on an installment plan, you pay \$100 down and \$60 per month for 36 months. Find the finance charge.

35. Benjamin Toomey borrowed \$4,200 from his bank for two years at 10.5% annual interest. What total amount must he pay his bank at the end of two years?

36. The finance charge-on an \$800 loan for 6 months was \$46. Use the Annual Percentage Rate table to find the annual percentage rate of the loan.

37. Lee Moore's monthly gross pay is \$2,900. Out of those wages, \$304 in federal withholding, \$221.85 in FICA taxes, \$58 in state income taxes, and \$175 in health insurance premiums were deducted. Find the percentage of gross pay that Lee takes home, to the nearest percent.



Supri Suharjoto/Shutterstock.com

38. You take a cash advance on your credit card for \$450. There is a \$20 cash advance fee, plus daily periodic interest at an APR of 23%. You pay off the cash advance in 25 days. What is the total finance charge for the cash advance?

39. Felicia Delaney has a credit card that charges an APR of 12% applied using a monthly periodic rate on the average daily balance including new purchases. If Felicia's previous balance on 4/1 was \$572.01 and she made a purchase of \$125 on 4/3 and a payment of \$400 on 4/30, what is her finance charge for April?

40. How much is a 3% balance transfer fee on a transfer of \$2,000?

6-2

Renting or Owning a Home

GOALS

- Calculate the costs of home ownership
- Calculate the cost of renting a home or apartment
- Compare the costs of renting vs. owning

KEY TERMS

- depreciation
- security deposit

Start Up ▶ ▶ ▶

Several students who will attend the same college next fall plan to rent apartments. They have been talking about pooling the money they will be paying for rent and using it instead to buy an old, large house in which all of them could live. They believe they could save money by making monthly mortgage payments instead of paying rent. One of the students thinks his father would be willing to sign for the loan. What advice would you give the students?

Photodisc/Getty Images

Math Skill Builder

Review these math skills and solve the exercises that follow.

1 **Add** money amounts.
Find the sum: $3,600 + $180 + $1,267 + $683 = $5,730

1a. $5,120 + $1,568 + $462

1b. $12,874 + $1,236 + $658

1c. $2,806 + $4,902 + $765

1d. $16,234 + $6,498 + $2,555

2 **Subtract** money amounts.
Find the difference: $11,005 − $1,643

2a. $12,905 − $1,238

2b. $12,858 − $11,983

2c. $18,600 − $8,932

2d. $6,788 − $4,076

3 **Multiply** money amounts by percents and whole numbers.
Find the product: 2% × $78,400 = 0.02 × $78,400 = $1,568
Find the product: 12 × $764 = $9,168

3a. 3.5% × $126,900

3b. 1.75% × $56,513

3c. 12 × $45.60

3d. 12 × $567 =

Costs of Home Ownership

After the home is bought, a homeowner has many ongoing expenses. Cash has to be paid out for property taxes, repairs, maintenance, utilities, insurance, mortgage interest, and special services such as trash pickup. Two other less obvious expenses are depreciation and the loss of income on the money invested in the home.

Depreciation is the loss in value of property caused by aging and use. The loss in value may be caused by the wearing out of parts of the home, such as the roof. It may also occur as home styles change or if the home becomes too expensive to heat and cool as energy costs rise. Most housing depreciates slowly at about 1% to 4% of its original value per year.

The amount of depreciation cannot be calculated until a house is sold. Until that time, depreciation must be estimated. Estimates of depreciation are often shown as a percent of the original purchase price.

Loss of income occurs because the money initially invested in buying the property (down payment and closing costs) could have been deposited in a savings account or other investment and earned interest.

One financial benefit homeowners have is that they may include the interest they pay on their home mortgage and the property taxes they pay on their property as itemized deductions on their income tax return. This reduces the income tax they pay. Homeowners also build equity in their homes. *Equity* is the difference between what is owed on a home and its value.

EXAMPLE 1

The Hansens want to buy a home. The interest they will pay on their mortgage in the first year will be $5,244. The annual property taxes on the home are $2,350, and an insurance policy on the home will cost $360 a year. They estimate that the home will depreciate $1,240 the first year, utilities will cost $1,710, and maintenance and repairs will cost $1,535. They lose $1,270 interest on their down payment.

They estimate that they will save $1,428 in income taxes in the first year because the mortgage interest and property taxes will raise their itemized deductions above the standard deduction allowed. What will be the net cost of owning the home in the first year for the Hansens?

SOLUTION

Add all the expense items.

$5,244	mortgage interest
2,350	property taxes
360	insurance
1,240	depreciation
1,710	utilities
1,535	maintenance, repairs
+ 1,270	lost interest
$13,709	total expenses

Subtract the tax savings.

$13,709	total expenses
− 1,428	tax reductions
$12,281	net cost for the first year

The Hansen's net cost of owning the home in the first year is $12,281.

✔ CHECK YOUR UNDERSTANDING

A. The Krafts want to buy a home. Their estimated first-year expenses are: mortgage interest, $6,848; property taxes, $3,782; insurance, $560; depreciation, $1,790; utilities, $1,300; and maintenance and repairs, $2,050. They estimate lost interest income on savings to be $1,562. Income tax savings are estimated to be $1,320. Find their net cost of home ownership for the first year.

B. The Khurana family is building a home for $87,000 on a lot they own. They estimate their expenses for the first year to be: mortgage interest, $5,788; property taxes, $1,904; insurance, $347; lost interest income, $1,140; depreciation, 2% of the home's cost; maintenance and repairs, $900. The cost of heating, electricity, and water is estimated to be $1,860. The Khurana's expect to save $1,050 in income taxes as a result of owning the home. What will be the net cost of the home the first year?

Math *Tip*

When depreciation is shown as a percent, multiply the depreciation rate times the home's value to find the amount of depreciation.

Costs of Property Rental

Some people rent until they can afford to buy a home. Others prefer to rent. Many people prefer not to worry about the expense and effort of maintaining a property.

Renters usually pay a one-time **security deposit** in addition to their first month's rent when they sign a *lease,* or rental agreement. Return of the security deposit at the end of the lease is not guaranteed. The property owner may keep the security deposit to pay for repairs to the rental property or to clean the property, if the renters have not done so.

EXAMPLE 2

Mary Beth Berkovic plans to rent an apartment for $710 a month, including heat and water. The security deposit will be one month's rent. She estimates that other annual costs connected with the apartment will be: insurance, $110; utilities, $600; covered parking space, $240. What is Mary Beth's first-year cost of renting the apartment?

SOLUTION

$12 \times \$710 = \$8{,}520$ yearly rent

$\$8{,}520 + \$710 + \$110 + \$600 + \$240 = \$10{,}180$ total first-year cost

✔ CHECK YOUR UNDERSTANDING

C. Rick Cassell rented an apartment for one year and paid $625 monthly rent. His other apartment-related costs for the year were: security deposit of $625; insurance, $85; utilities, $1,210; replacement of lost mailbox key, $10. What was the cost of renting the apartment for the one year?

D. Belinda Pryor's monthly rent on a house she is leasing is $1,250. The security deposit is one month's rent. Belinda is responsible for mowing the lawn and clearing snow and estimates she will spend $100 a month to have this done. Her other annual costs include $136 for insurance and $1,700 for utilities. What will be her first-year costs of renting this home?

Compare Renting and Owning Homes

When you buy or rent property you have some expenses that are similar, such as insurance and utilities. Most other expenses are quite different as are the sizes of the properties and their locations. For these reasons, it is very difficult to compare the purchase of a home to the rental of an apartment. However, the costs of owning a home and renting a similar home can be compared.

EXAMPLE 3

Cedric Thorne has $17,000 he can use as a down payment on a house that sells for $85,000. The interest for a year on his mortgage would be $5,184. He estimates his property taxes to be $1,720. Other costs of home ownership would total $3,270. He would lose $680 interest on his down payment and closing costs, but would save $895 on income taxes. Cedric can rent a similar home for $850 a month with a $1,200 security deposit. His other annual expenses of renting would be $130 for insurance and $1,400 for utilities. For the first year, is it less expensive for Cedric to buy or rent a home, and what is the difference?

SOLUTION

Find the net cost of home ownership.

$(\$5{,}184 + \$1{,}720 + \$3{,}270 + \$680) - \$895 = \$9{,}959$ cost of home ownership

Find the cost of renting.

$12 \times \$850 = \$10{,}200$ annual rent

$\$10{,}200 + \$1{,}200 + \$130 + \$1{,}400 = \$12{,}930$ cost of renting

Find the difference between owning and renting.

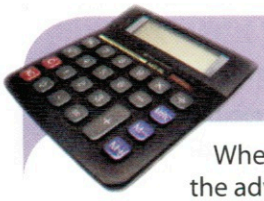
$\$12{,}930 - \$9{,}959 = \$2{,}971$

Buying is $2,971 less expensive than renting for the first year.

✔ CHECK YOUR UNDERSTANDING

E. Lynette Wolfe estimates her loan interest, taxes, insurance, and maintenance to be $9,100 on a house she bought for $83,600. She estimates her house would depreciate $2,926 a year. Lynette would lose $560 interest on the cash invested in her home, but would pay $1,600 less in income taxes. She could have rented the house for $785 a month, paid insurance of $115, utilities of $1,150, and not had any maintenance expenses except for the cost of routine cleaning. She also would have paid a security deposit of $200. For the first year, would it have been cheaper to rent or buy the house?

F. If Roscoe Tippin bought a manufactured home instead of continuing to rent an apartment, these expenses would increase by the amount shown: insurance, $276; utilities, $980. His annual interest on the mortgage would be $4,060, and he would have to rent a lot on which to place the home for $240 a month. The current monthly rent on his apartment is $510. Depreciation on the home is estimated to be $764. If he bought the home he would lose $57 interest on the cash invested, pay yearly property taxes of $945, and have income tax savings of $274. Is it more expensive for Roscoe to rent the apartment or buy the home, and how much more?



Financial Responsibility

When considering whether to buy a home or rent a place to live, making a list of the advantages and disadvantages for each option is one way to make an informed decision. A person's actual list can look similar to the list below, but will also likely include specific amounts for the costs associated with both.

Buy or Rent?	
Advantages of Renting • *No down payment* You can earn interest on the money you would have used for a down payment. • *More predictable housing costs* No responsibility for repair and upkeep beyond normal cleaning. • *Mobility* You can move whenever you want to after giving the required notice.	**Disadvantages of Renting** • *No ownership* Your monthly payments do not give you ownership of anything. • *Rent increases* Over time, you can expect the cost to rent the same place will increase. • *Restrictions* The property owner sets the rules for what you can do in and to your living space. • *No tax deduction* Rent payments are not deductible on federal income taxes.
Advantages of Buying • *Ownership* Monthly payments lead to ownership. • *Potential value* Some dwellings will increase in value over time. • *Tax deduction* Money paid in interest and property taxes can decrease your taxes. • *Fewer restrictions* Since you own the property, you can do what you want on your property within the law.	**Disadvantages of Buying** • *Down payment and closing costs* You need money up front to obtain a mortgage. • *Property taxes* Taxes add to the cost of owning a home. • *Restricted mobility* You may have to sell the house to relocate, and there are no assurances that the value of your home at that time will have increased from when you purchased. • *More responsibility* You must handle all maintenance and repairs.

Wrap Up ▶ ▶ ▶

Buying a house instead of just renting an apartment presents several problems when expenses are shared. There is no guarantee that all the students will remain in school, and some will be in school longer than others. All would have to cooperate in maintaining the property to keep up its value.

Also, the student group may not be able to afford to pay the cost of major, unexpected repairs. The purchase of a home also requires money up front to make the down payment and pay closing costs. Finding a parent willing to make such a financial investment may be a possibility, but not a certainty.

Communication

The monthly rent for a large luxury apartment in an exclusive high-rise building in New York City is $7,000 a month. An apartment of the same size located in a mid western city costs only $2,000 a month. Write the reasons you think could account for the difference in rents. Share your thoughts with other class members in class discussion.

Exercises

Find the sum.

1. $12,876 + $1,003
2. $284 + $128 +$265

Find the difference.

3. $12,736 − $9,375
4. $1,680 − $735

Find the product.

5. 2.5% of $140,300
6. 1.5% of $67,200
7. 12 × $578
8. 12 × $67.50

Solve.

9. Mort Silver owns a home. He estimates his expenses as mortgage interest, $10,180; property taxes, $3,690; insurance, $833; depreciation, $3,800; maintenance and repairs, $900; lost interest income, $2,375; and utilities, $2,450. He expects to save $3,700 in income taxes. What is his net cost of home ownership?

10. Joyce Navarro-Martin wants to buy a home for $73,200. She estimates her first-year expenses to be mortgage interest, $6,810; lost interest of $971; property taxes, $1,585; insurance, $395; depreciation at $1,098; maintenance and repairs, $1,800; and utilities, $1,250. She expects to save $1,847 in taxes. What will be the net cost of owning the home in the first year?

Photodisc/Getty Images

11. Patricia McCarthy lives in a subsidized apartment complex for low-income senior citizens. She pays monthly rent of $297 for a unit that could rent for $650 a month elsewhere. The monthly rent provides heat and water, but does not cover the $42 average monthly cost of electricity. She carries no insurance on the contents of the apartment. What are her annual costs of renting the apartment?

12. Tyrone Northrup pays monthly rent of $1,240 for a one-bedroom apartment in a large city. He pays an extra monthly charge of $160 to the rental company for a parking space in an attended lot. His other costs are: electricity, $90 a month; other utilities, $860 a year; and insurance, $170 a year. What is his annual cost of renting?

13. Sybil Kline rents a home for $970 a month. Her other annual expenses of renting total $1,305. If she buys the home, her estimated yearly expenses would be mortgage interest, $5,100; property taxes, $1,890; depreciation, $2,400; maintenance, $1,100; insurance, $479; utilities, $1,470; and lost interest income, $1,020. She would save $1,536 in income taxes. Are her net annual costs of housing lower by renting or buying? How much is saved?

Carole Finney rents an apartment for $640 a month and pays $120 for insurance and $820 for utilities yearly. She can buy a home with about the same space for $52,000. If she buys the home, she must withdraw $10,400 from her savings account and lose $624 interest. Her other home ownership expenses are estimated to be $9,300. She also estimates that owning a home will save her $1,428 in income taxes.

14. What is her total cost of renting for the year?

15. Which costs more, renting or owning? How much more?

16. **INTEGRATING YOUR KNOWLEDGE** Stephanie Larken presently rents an apartment for $580 a month. She estimates that her rent will increase 4% each year and that she will make total rent payments of $207,592.68 over 20 years. Her insurance and utility bills will average $800 a year over the 20 years. Stephanie has savings that she could use to buy a home with the same space as her apartment for $62,000. If she makes a 5% down payment and pays closing costs of $1,900, she can get a 20-year mortgage with a monthly payment of $465.53. Stephanie estimates her average annual ownership expenses as: depreciation, $1,150; maintenance, $1,400; insurance, $280; property taxes, $1,970, utilities, $1,390. Her income tax savings would average $965 a year. Interest of $310 a year could be earned on the money used for the down payment and closing costs. What is the total amount Stephanie might pay out over 20 years for renting the apartment and buying the home? Which plan do you think would work best for Stephanie?

17. **CRITICAL THINKING** Some homes are worth more now than when they were purchased. These homes are said to have appreciated, or increased in value. In this lesson you calculated the estimated depreciation on homes. Can homes appreciate and depreciate at the same time?

Mixed Review

18. $92.75 + $11.49 + $102 + $42.11 + $905.72

19. Round to the nearest 10,000: 129,817

20. Round to the nearest 10,000: 487,299

21. Lou Miller paid $39 interest on a promissory note of $1,200 for 3 months. Find the interest rate he paid.

22. Stella Sabo worked these weekly hours in February: $27\frac{1}{2}$, $30\frac{3}{4}$, $38\frac{1}{2}$, $31\frac{1}{2}$. What average number of hours did she work per week for these four weeks, to the nearest tenth hour?

23. What amount of tax will be owed on an income of $63,280 if the city income tax rate is 1.5% of all income?

24. Find the finance charge per $100 on a loan of $8,260 with a finance charge of $1,230.

25. Felicia Delaney uses her credit card to take a cash advance on September 6. She pays off the loan on November 3. For how many days did she borrow money from her credit card company?

6-3

Property Taxes

GOALS

- Calculate the decimal tax rate
- Calculate property taxes for tax rates per $100 or $1,000
- Calculate property taxes for tax rates in mills or cents per $1

KEY TERMS

- property tax
- assessed value

Start Up ▶▶▶

Renters of apartments or homes do not own the property they rent. Do the renters have to pay any property taxes?

Mirenska Olga/Shutterstock.com

Math Skill Builder

Review these math skills and solve the exercises that follow.

1. **Multiply** money amounts by decimals.
   Find the product. $72,000 × 0.0587 = $4,226.40

   1a. $1,000 × 0.0564 **1b.** $84,000 × 0.0642

2. **Divide** money amounts by money amounts.
   Find the quotient. $75,126 ÷ $1,000 = 75.126

   2a. $46,300 ÷ $100 **2b.** $59,317 ÷ $1,000

3. **Divide** money amounts and round to the nearest ten-thousandth.
   Find the quotient. $507,000 ÷ $8,000,000 = 0.06338, or 0.0634

   3a. $483,200 ÷ $6,000,000 **3b.** $889,600 ÷ $9,800,000

Decimal Tax Rate

Property taxes are taxes on the value of real estate such as homes, business property, or farm land. Taxes are collected annually or semiannually by the tax departments of local tax districts such as cities and towns in which the property is located.

Services that are often supported by taxes include schools, government operations, fire and police protection, and parks and road maintenance.

The amount of property tax paid is based on the **assessed value** of a property. Local tax assessors calculate this value. For example, the Watson's tax bill below shows their property has a fair market value of $150,000. It is assessed at 40% of its market value, or $60,000. The assessed values of properties are usually less than their market values. Similar properties in the same community should have similar assessed values.

Local tax districts determine the tax rate needed to pay for the services they provide. They estimate their expenses for the coming year and prepare an expense budget. They also estimate income from sources other than the property tax, such as licenses, fees, fines, rents, state aid, and so on. The difference between the total budget and the income from other sources is the amount that must be raised by the property tax.

PARCEL I.D. NO.	LOAN I.D. NO.	ASSESSMENT RATE
13-89-47699	*3870-7798*	*40%*

MARKET VALUE	ASSESSED VALUE	TAX RATE
$150,000	*$60,000*	*0.062*

PROPERTY OWNER AS OF 11/30/94

TAYLOR AND ROWENA WATSON

PROPERTY DESCRIPTION

45 SEVENTH STREET
MADISON, IL 62060-1978

MAILING ADDRESS

c/o WATSON, TAYLOR AND ROWENA
45 SEVENTH STREET
MADISON, IL 62060-1978

TAXING DISTRICT	AMOUNT OF TAX
COUNTY	$480.10
TOWN	152.00
ROAD & BRIDGE	150.30
SCHOOL DISTRICT	1,790.60
TOWNSHIP	750.30
FIRE DISTRICT	190.95
COMMUNITY COLLEGE	205.75
TOTAL TAX DUE	$3,720.00

= NET GENERAL TAXES
SECOND HALF TAXES
DUE FEBRUARY 6, 20--
OR AS EXTENDED BY LAW

PAY THIS AMOUNT

LAST DAY OF PAYMENT AS EXTENDED WITHOUT PENALTY
2/6/20--

REAL ESTATE TAX
BILL CTL NO.
369669-5

OFFICE PAYMENT HOURS
8:00 A.M. TO 4:00 P.M. MON. THRU FRI.

TAXPAYER'S RECEIPT
YOUR CANCELLED CHECK IS YOUR RECEIPT. FOR AN ADDITIONAL RECEIPT, RETURN ENTIRE STATEMENT AND A SELF-ADDRESSED STAMPED ENVELOPE.

Local tax districts then determine the *decimal tax rate*, which is the tax rate at which property is to be taxed. They find the decimal tax rate by dividing the amount to be raised by the property tax by the total assessed value of all property in the district.

$$\text{Decimal Tax Rate} = \frac{\text{Amount to be Raised by Property Tax}}{\text{Total Assessed Value}}$$

EXAMPLE 1

The Columbia School District's total budgeted expenses last year were $6,000,000. Estimated income from other sources was $1,800,000. The total assessed value of all taxable property in Columbia last year was $39,000,000. Find the decimal tax rate needed to meet expenses, rounded to the nearest hundred thousandth.


Photodisc/Getty Images

SOLUTION

Subtract the income from other sources from the total budgeted expenses to find the income to be raised from property taxes.

$6,000,000 − $1,800,000 = $4,200,000 property tax income needed

Divide the income to be raised from property taxes by the total assessed value of all property.

Decimal tax rate = $4,200,000 ÷ $39,000,000 = 0.107692 = 0.10769

✔ CHECK YOUR UNDERSTANDING

A. Filber County's budget for a year is $6,750,000. Of that, $650,000 is raised from other income, and the rest from property taxes. The total assessed value of the county's property is $80,000,000. What is the decimal tax rate, rounded to the nearest thousandth?

B. The Gayle Fire District must raise $1,950,000 from property taxes. The assessed value of property in the district is $48,200,000. What is the decimal tax rate needed, to the nearest ten thousandth?

In some communities the decimal tax rate is shown as a rate per $1,000 or $100, cents per $1, or mills per $1. So, the Watson's tax rate of 0.062 could also be stated as:

$62 per $1,000 (0.062 × $1,000 = $62)

$6.20 per $100 (0.062 × $100 = $6.20)

6.2 cents per $1 (0.062 × 100 cents = 6.2 cents)

62 mills per $1 (0.062 × 1,000 mills = 62 mills)

All the tax rates are equivalent, and the tax due on the Watson's property in all cases is $3,720.

Math *Tip*

A mill is one-tenth of a cent and one thousandth of a dollar.

Tax Rates per $100 or $1,000

To find the tax due on property when the rate is in $100 or $1,000, first find the number of $100 units or $1,000 units in the assessed value. Then, multiply the numbers of units by the tax rate to find the tax due.

EXAMPLE 2

Calculate the property tax due on the Watson's property if their tax rate is stated as $6.20 per $100.

SOLUTION

Divide the assessed value by $100.

$60,000 ÷ $100 = 600 number of $100 units in the assessed value

Multiply the tax rate per $100 by the number of $100 units.

600 × $6.20 = $3,720 property tax due

Math *Tip*

To quickly divide by 100, move the decimal point two places to the left; move the decimal point three places to the left to divide by 1,000.

✔ CHECK YOUR UNDERSTANDING

C. The tax rate for the town of Beal is $3.736 per $100. Find Rita's tax bill if her property in Beal is assessed at $42,000.

D. Find the tax on property assessed at $120,000 if the tax rate is $4.128 per $100.

EXAMPLE 3

Calculate the property tax due on the Watson's property if their tax rate is stated as \$62 per \$1,000.

SOLUTION

\$60,000 ÷ \$1,000 = 60 number of \$1,000 units in the assessed value

60 × \$62 = \$3,720 property tax due

✔CHECK YOUR UNDERSTANDING

E. What tax must Art pay on his home, assessed for \$67,500 if his tax rate is \$50.08 per \$1,000?

F. The Gilbey family owns a cabin and land with an assessed value of \$13,500. What property tax do they pay if the tax rate on the property is \$25.83 per \$1,000?

Tax Rates in Mills or Cents per Dollar

Some communities show the tax rate in mills. A mill is one tenth of a cent, and one thousandth of a dollar. There are ten mills in one cent and 1,000 mills in one dollar.

To find the tax due when the rate is in mills or cents per \$1 of assessed value, change the rate to a rate in dollars. Then multiply that rate by the assessed value.

To change mills to dollars, divide the number of mills by 1,000. To change cents to dollars, divide the number of cents by 100.

EXAMPLE 4

Calculate the tax due on the Watson's property if their tax rate is stated as either 62 mills or 6.2 cents per \$1 of assessed value.

SOLUTION

62 mills ÷ 1,000 = \$0.062 mills rate changed to rate in dollars

6.2 cents ÷ 100 = \$0.062 cents rate changed to rate in dollars

\$60,000 × \$0.062 = \$3,720 total tax amount

✔CHECK YOUR UNDERSTANDING

G. The city tax rate in Milser is 52 mills per \$1 of assessed value. Find the tax to be paid on property assessed at \$38,400.

H. What tax must Michelle Nolan pay on a condominium assessed at \$32,100 if her tax rate is 3.8 cents per \$1?

Wrap Up ▶▶▶

Renters pay property taxes indirectly through the rent they are charged. The owners of the real estate being rented must pay property taxes on its assessed value. The rents the owners charge usually cover their expenses, including property taxes.

Communication

Contact your city or town tax office and find out what taxes are charged property owners to support local government services and schools. Also find the rates at which taxes are levied. Write a short report summarizing your findings.

Exercises

Find the product.

1. $900 \times \$6.86$
2. $1{,}370 \times \$5.07$

Find the quotient.

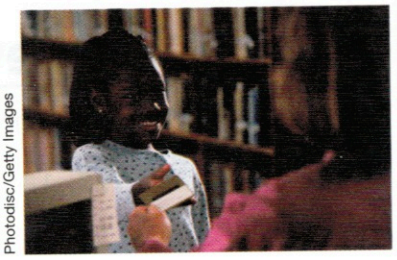
3. $\$125{,}300 \div \$100$
4. $\$467{,}890 \div \$1{,}000$

Find the quotient, correct to the nearest ten thousandth.

5. $\$264{,}000 \div \$9{,}300{,}000$
6. $\$1{,}315{,}000 \div \$24{,}100{,}000$

Solve.

7. Property in the Bello School District has a total assessed value of $98,500,000. The district's budget for next year shows expenses totaling $5,000,000. The district expects to receive $3,200,000 from sources other than property tax. What decimal property tax rate, to the nearest ten thousandth, will the district use to raise enough money to meet budgeted expenses?
8. Hazel Forest City plans to spend $4,470,000 next year. Income from sources other than property tax will be $1,430,000. The taxable property in the city has an assessed value of $78,000,000. Find the tax rate, correct to the nearest hundred thousandth.
9. Carlos' property is assessed at $92,700. The school tax rate in his district is 1.45 cents per $1. What is Carlos' school tax?
10. Redfield Township levied a property tax of 1.5 mills per $1 to pay for new equipment for its fire department. If the total value of all property in the township is $790 million, what amount will be raised by this tax to pay for new equipment?



Photodisc/Getty Images

11. The town of Chester has a tax rate of 47.079 mills per $1. Find the tax on property in Chester worth $350,000, assessed at 60% of its market value.
12. Voters in Harmon approved a library tax of 0.75 mills per $1 of assessed value. What amount of library tax will a business owner pay for property assessed at $240,000?

Find the amount to be raised by property tax and the tax rate. Show the rate as a decimal, correct to the nearest thousandth.

	Assessed Value	Total Expenses	Other Income	Raised by Property Tax	Tax Rate
13.	$27,000,000	$989,000	$87,000		
14.	$36,000,000	$878,000	$97,500		
15.	$22,750,000	$382,700	$68,400		
16.	$ 7,900,000	$396,300	$45,600		

Find the tax due for Exercises 17–24.

	Assessed Value	Tax Rate	Tax Due
17.	$18,000	$5.20 per $100	
18.	$48,500	$71.10 per $1,000	
19.	$37,000	3.5 cents per $1	
20.	$25,300	77.3 mills per $1	
21.	$59,100	$4.747 per $100	
22.	$89,000	$87.45 per $1,000	
23.	$60,200	4.28 cents per $1	
24.	$19,800	56.82 mills per $1	

25. **CRITICAL THINKING** Business firms are often given a tax abatement to encourage them to build or expand their operations in a community. The tax abatement usually reduces the amount of tax paid by the business over several years. For example, the abatement could be a 50% reduction in taxes for 20 years. Are such tax abatements to businesses fair to homeowners who do not get such tax reductions?

26. **INTEGRATING YOUR KNOWLEDGE** Maxine Campau lives in a city that has a flat tax rate of 0.5% on all income. The city property tax rate is 3.43 cents per $1. The county in which Maxine lives also charges tax on property at a rate of 2.3 mills per $1 to pay for county operations. Maxine expects her income this year to be $52,000. Her home has an assessed value of 50% of its market value of $110,000. What total amount will Maxine expect to pay this year in city income tax and property taxes?

Mixed Review

27. 0.004×84.27

28. $1\frac{7}{8} \times 6$

29. Write $\frac{9}{20}$ as a decimal

30. $\$4{,}228 \div 7$

31. Estimate. Then, find the exact product: 80.35×29

32. Round the result of $135.7 \div 5.2$ to the nearest hundredth.

33. Winston Chambers borrows $3,000 at 7% exact interest for 43 days. What interest will he pay on the loan?

34. A futon has a cash price of $650. To buy it on an installment plan, you pay $100 down and $40 a month for 18 months. What finance charge will you pay for this purchase?

35. You borrowed $300 for 15 days using your credit card's cash advance feature. The credit card company charges a $5 fee and a daily periodic interest rate of 0.0482% on the cash advance. What was the total finance charge on the cash advance?

6-4

Property Insurance

GOALS

- Calculate property insurance premiums for homeowners
- Calculate property insurance premiums for renters
- Calculate how much can be collected on insurance claims

KEY TERMS

- homeowners insurance
- premium
- renters policy

Start Up ▶▶▶

Some people insure their homes for less than they are worth to save money on their home insurance policy. Is this a wise decision?

Michael Shake/Shutterstock.com

Math Skill Builder

Review these math skills and solve the exercises that follow.

1. **Add** money amounts.
Find the sum. $462 + $89 = $551

1a. $728 + $127 **1b.** $327 + $46

2. **Subtract** money amounts.
Find the difference. $58,000 − $750 = $57,250

2a. $1,284 − $500 **2b.** $6,738 − $250

3. **Multiply** money amounts by percents.
Find the product. $86,000 × 80% = $86,000 × 0.8 = $68,800

3a. $75,000 × 90% **3b.** $42,500 × 80%

4. **Multiply** money amounts by whole numbers and **round** to the nearest dollar.
Find the product. 762 × $0.83 = $632.46 = $632

4a. 1,051 × $0.54 **4b.** 797 × $0.67

4c. 2,020 × $0.34 **4d.** 1,565 × $0.88

5. **Divide** money amounts by money amounts.
Find the quotient, to the nearest thousandth. $38,000 ÷ $56,000 =

5a. $43,000 ÷ $60,000 **5b.** $85,000 ÷ $120,000

5c. $117,000 ÷ $155,000 **5d.** $99,000 ÷ $135,000

Property Owners Insurance Premiums

A policy that covers your home and protects you against other risks is called **homeowners insurance**. Basic homeowners insurance covers:

- *Dwelling*, the home in which you live
- *Other structures*, such as a garage
- *Personal property*, includes the contents of a home
- *Additional living expense*, which pays for the extra costs of living when you cannot use your own home because of damage
- *Personal liability*, which protects you in case of lawsuits by persons injured on your property
- *Medical payments to others*, but not to you or your family, for medical expenses in case of injury on your property

The amount for which your home is insured is called the *face value* of the policy. That amount determines the amount of insurance you have in other categories.

For example, if your home is insured for a face value of $60,000, personal property is usually covered for 50% of that amount, or $30,000. Additional living expense coverage is typically 20% of the face value, or $12,000.

Homeowners policies may provide other options as well. For example, a policy may insure personal property when you are away from home. This coverage is called *off premises* and is usually for 10% of the amount of the policy.

For example, if the luggage and clothes you take on vacation are stolen, their loss would be covered under the off premises policy feature.

REPLACEMENT COST POLICIES Under replacement cost policies, the insurance company will pay the cost of replacing your property at current prices. If a leather chair that costs $600 is destroyed by fire, the insurer will pay for a replacement chair that now costs $900 even though the cost is higher than the original purchase price.

Before issuing this type of policy, insurers usually require a survey and inspection of the property. Also, the property must be insured for 100% of its current replacement value with automatic annual adjustments for inflation.

Premiums for this type of policy are 10–15% higher than a standard policy because of the extra protection it offers.

Business *Tip*

Basic policies often do not cover the full value of jewelry, cameras, computers, furs, and valuable collections. Special insurance called a personal articles floater is required to insure such items to full value.

Photodisc/Getty Images

Business *Tip*

Most homeowners policies do not cover damage caused by earthquakes, floods, termite and other pest damage. In addition, policies will typically not cover losses if the house is vacant 60 days or more.

INSURANCE PREMIUMS The money paid to an insurance company for property insurance is the **premium**. The premiums you pay depend on many things, such as how much and what kind of coverage you buy, how your house or apartment is built, and where it is located. For example, the premium rates for a brick house near a fire department will be less than for a house made of wood that is far from a fire department.

Some items such as computer systems, jewelry, and expensive entertainment systems may not be covered by a basic policy. You will have to buy additional insurance, called a *rider*, or *floater* to cover possible loss.

Property insurance rates are usually based on $100 units of insurance.

NOTE: Homeowners insurance premium charges are rounded to the nearest dollar.

EXAMPLE 1

Marion Duval insured his house for $89,000 at an annual rate of $0.51 per $100. Find his premium.

SOLUTION

Find the number of $100 units in the insured amount.

$89,000 ÷ $100 = 890 number of $100 units

Multiply the rate per $100 by the number of $100 units.

890 × $0.51 = $453.90, or $454 premium rounded to the nearest dollar

✔ CHECK YOUR UNDERSTANDING

A. Nolan Harwood insured his home for $61,000. Find the annual premium, to the nearest dollar, he will pay for a policy that costs $0.46 per $100.

B. Mandy Wisko insures her home for $43,000. What annual premium will she pay if the policy cost is $0.74 per $100?

Renters Insurance Premiums

If you rent a house or an apartment, you can buy a **renters policy** that provides nearly the same coverage as a homeowners policy except for loss of the dwelling and other structures. Annual premiums for a renters policy are based on the amount of insurance on the contents of your apartment or rental home. The table below shows the annual premium charged by one company for a basic renters policy.

Maximum Amount of Coverage on Contents	Distance From Fire Station	
	Less Than 5 Miles	5 Miles or More
$ 5,000	$120	$138
$10,000	$129	$148
$15,000	$140	$161
$20,000	$152	$175
$25,000	$165	$190
$30,000	$177	$204

EXAMPLE 2

Myron Segal rents an apartment that is 4.1 miles from a fire station. He insures its contents for $10,000. A computer system Myron owns is also insured, but at an extra cost of $27 per year. What total annual premium will Myron pay for this coverage?

SOLUTION

Locate the correct insurance amount row and distance from fire station column to find the basic premium.

The basic premium is $129.

Add to the basic premium the cost of additional insurance, if any.

$129 + $27 = $156 total annual premium

✔ CHECK YOUR UNDERSTANDING

C. Ed and Kathryn Bosh want to insure their apartment's contents for $25,000. In addition, they decide to insure jewelry appraised at $3,000 for an additional premium of $31. They live one block from the fire station. Find their total premium for one year.

D. Samantha Hilliard rents a home that is located 12 miles from the nearest fire station. She insures the home's contents for $5,000. What annual premium will she pay?

Collecting on Insurance Claims

Photodisc/Getty Images

If your property is damaged by fire or a theft occurs, you have to file a claim with your insurance company. The company will send an adjuster to look at the property and decide on the amount of loss. The amount of the loss your insurance company pays depends on the type of coverage you have.

If you have a basic policy, the company will pay the full amount of the loss up to the face value of the policy. It will not pay more than the amount of your policy.

Your basic policy usually contains a *deductible*. With a $100 deductible, you are responsible for the first $100 of loss. The insurance company pays the full amount less the deductible up to the face value of the policy. The higher the deductible the lower the premium.

Business *Tip*

When a loss occurs, coinsurance policies pay only the depreciated value of personal property, not its replacement cost.

EXAMPLE 3

Your policy has a face value of $30,000 with a $1,000 deductible. How much will the insurance company pay if your loss is $7,800?

SOLUTION

Find the amount paid by the insurance company by subtracting the deductible from the loss amount.

$7,800 − $1,000 = $6,800 amount insurance company pays

✔ CHECK YOUR UNDERSTANDING

E. How much will an insurance company pay for a loss of $10,200 if property is insured for $18,000 with a $250 deductible?

F. Property insured for $70,000 with a $500 deductible suffers a loss of $65,000. How much will the insurance company pay?

If you have a *coinsurance policy*, you purchase insurance up to a stated percent of the value of the property. This is usually 80% of the property's value. If you have a property valued at $50,000 and insure it at 80%, the coinsurance coverage is $40,000. Because the property is insured for less, the annual premium will be less also.

If you have a *coinsurance policy* and carry the required insurance, the insurance will pay for losses up to the face value of the coinsurance policy. If the coinsurance carried is less than 80% (or the agreed upon coinsurance percent), an insurance company will pay only a fractional part of the damages. The formula used is:

$$\text{Amount Paid by Insurance Company} = \frac{\text{Face Value of Policy}}{\text{Required Amount of Coinsurance}} \times \text{Amount of Loss}$$

EXAMPLE 4

A building with a value of $50,000 is insured for $24,000 under an 80% coinsurance policy. The building had fire damage of $7,200. What amount did the insurance company pay?

SOLUTION

The face value of the policy is $24,000.

$\$50{,}000 \times 80\% = \$50{,}000 \times 0.8 = \$40{,}000$ required coinsurance

Divide the face value of the policy by the required amount of coinsurance. Then multiply the result times the loss amount.

$\frac{\$24{,}000}{\$40{,}000} \times \$7{,}200 = 0.6 \times \$7{,}200 = \$4{,}320$ amount insurance pays

✔ CHECK YOUR UNDERSTANDING

G. Betsy Rowan has an 80% coinsurance policy $41,600. Her home is worth $65,000. What insurance on a $4,000 loss?

H. Casey Maynard's home is worth $90,000. He on an 80% coinsurance policy. What amount pay on a $42,000 loss?

yurok/Shutterstock.com

Wrap Up ▶ ▶ ▶

Carrying less insurance is one way to save money, but the property owner carries a great risk to save a relatively small amount of money. Since a home is the greatest investment that most people will make in their lifetime, it is good practice to protect the investment and insure the property for full value.

TEAM Meeting

A homeowners insurance policy that provides additional coverage is known as a Broad Form, HO2 policy. Find out what the HO2 policy covers. Also find out what other forms of homeowners insurance exist and what they cover. Summarize in a paragraph what the general differences are, if any, between the policies. Suggested sources include insurance company sites on the Internet insurance agents, or a search of the Internet using the term Broad Form, HO2 policy.

Exercises

Find the sum.

1. $820 + $79
2. $455 + $66

Find the difference.

3. $26,870 − $250
4. $1,025 − $750

Find the product.

5. $67,000 × 85%
6. $137,100 × 90%
7. $78,000 × 75%
8. $326,400 × 65%

Find the quotient to the nearest thousandth.

9. $36,000 ÷ $51,000
10. $74,000 ÷ $78,000

Find the quotient.

11. $150,500 ÷ $100
12. $36,440 ÷ $100
13. $189,350 ÷ $100
14. $24,600 ÷ $100

Solve.

15. Find the premium, to the nearest dollar, for one year for a $61,000 policy at $0.47 per $100.
16. A $31,000 policy costs $0.68 per $100. Find the premium for one year, to the nearest dollar.
17. A home valued at $200,000 is insured for $0.56 per $100 on a basic policy. Earthquake insurance costs $850 extra a year. What total premium must be paid to insure this home?

The Woodman family moved to a new home in the same town. Their new house had the same value as their old home, $129,500. Because the new home is located more than 1,000 feet from a fire hydrant, their homeowners insurance rate increased by $0.11 per $100.

18. Estimate the amount their annual premium will increase?

19. Calculate their actual premium increase for a year.

Photodisc/Getty Images

20. Glenda Hope insures the basic contents of her apartment for $25,000 at the rate shown in the Renter's Insurance Table. She lives in the city a few blocks from the fire station. Glenda's depression glass collection is not covered by her basic policy, and she gets extra coverage at $0.35 per $100 of its $12,500 value. What annual premium does she pay?

Your home is valued at $130,000. Your insurance rate is $0.72 per $100. How much does it cost to insure the home for

21. 100% of its value?

22. an 80% coinsurance rate of its value?

Find the amount paid by an insurer for each loss in problems 23–27.

	Face of Policy	Amount of Loss	Value of Property	Coinsurance Percent	Amount Paid
23.	$45,000	$ 8,000	$75,000	80%	
24.	$63,000	$ 5,600	$90,000	80%	
25.	$40,000	$13,200	$60,000	80%	
26.	$45,000	$ 7,000	$62,500	80%	
27.	$49,000	$22,500	$70,000	90%	

28. Allison Renfrew had a $750 deductible, replacement cost policy. Her laser printer and fax machine were stolen. Their value was $824. How much did Allison collect from the insurance company?

29. Your policy has a face value of $20,000 with a $1,000 deductible. How much will your insurance company pay if your loss is $7,400? $12,000? $19,000?

30. CRITICAL THINKING A flood plain is an area where floods could possibly occur even though it may be some distance from a river. Why does the insurance on homes within the flood plain cost more even if the area has not been flooded for many years?

31. CRITICAL THINKING Homes located in certain coastal areas of the United States may be destroyed by hurricanes. Is an insurance company obligated by law or a principle of good business practice to provide insurance even for high risks?

32. FINANCIAL DECISION MAKING Benita Lahr insures her home for $60,000 and pays insurance at a rate of $0.50 per $100. She will receive a 2% discount if she installs smoke detectors and dead-bolt locks and has a fire extinguisher. These items will cost $250 to purchase and install. Should she install the safety devices to save 2%?

Mixed Review

33. $\$1{,}429 \div 100$

34. $\frac{1}{5} \times \frac{1}{7}$

35. $5\frac{3}{4} - 3\frac{1}{4}$

36. $15 - 12.78$

37. 8% of $1,675.40

38. Find $\frac{3}{10}$ of 28.

39. Rewrite 0.44 as a fraction in lowest terms.

40. In the number 1,427.589, what is the place value of the 4? the 9?

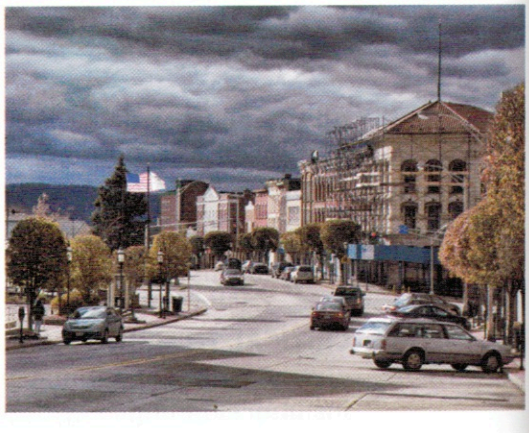
41. The previous balance on Nina Garcia's credit card is $225.83. Her credit card company charges an APR of 11%, applied at a monthly periodic rate. If the card company uses the previous balance method to calculate finance charges, how much will Nina be charged in finance charges if she has lost the grace period?

42. The installment price of a set of golf clubs is $947. You must pay $200 down and make payments for 18 months. What will be your monthly payments?

43. When Wallace Figueroa checked his March 8 credit card statement, he found a sales charge of $128.30 that was unauthorized. He also found that a sales slip for $36.25 dated March 11 did not appear on the statement. What is Wallace's correct new balance if the new balance listed on the statement is $301.68?

44. Find the ordinary interest from June 4 to June 16 on $1,000 at 15% interest.

45. The income tax rate for the city of Allenby was 1% last year, and is 1.25% this year. Syd Johnson expects his income this year to be the same as last year, $48,400. What city income tax will Syd owe this year? By what percent did Syd's income taxes increase this year?



June Marie Sobrito/Shutterstock.com

46. JP Grimshaw earns $3,750 each month. He pays $1,200 per month for housing and has a $400 per month car payment, $120 in minimum credit card payments, and a personal loan with a $420 monthly payment. To the nearest percent, what is JP's debt-to-income ratio? If you were a lender and JP came to you for a loan, what would you advise him?

47. Zechariah decides to put $200 each quarter into an account earning 4% interest compounded quarterly. How much will be in the account after 5 years? How much of that money will be interest?

48. Find the interest for six months on $400.60 at 1.25% annual interest paid semiannually.

6-5

Buying a Car

GOALS

- Calculate the MSRP for a new car, including optional equipment
- Calculate the delivered price and the balance due for a new car
- Calculate the delivered price and the balance due for a used car

KEY TERMS

- MSRP (Manufacturer's Suggested Retail Price)
- negotiation

Start Up ▶▶▶

Most people who buy a new car make a down payment, get a loan, and then make regular monthly payments until the loan is repaid. Others make regular payments into a savings account until they have enough money to pay the entire purchase price in cash. Which way is better?

Photodisc/Getty Images

Math Skill Builder

Review these math skills and solve the exercises that follow.

1 **Add** money amounts.
Find the sum. $\$23{,}456 + \$938.24 + \$198 = \$24{,}592.24$

1a. $\$19{,}276 + \$235$

1b. $\$187 + \$12{,}390.04$

1c. $\$57{,}143 + \$789$

1d. $\$90{,}872 + \$13{,}776$

2 **Subtract** money amounts.
Find the difference. $\$18{,}629 - \$1{,}500 = \$17{,}129$

2a. $\$14{,}592 - \$500$

2b. $\$27{,}582 - \$3{,}985$

2c. $\$52{,}005 - \$32{,}864$

2d. $\$16{,}936 - \$12{,}999$

3 **Multiply** money amounts by percents.
Find the product. $5.5\% \times \$26{,}780 = 0.055 \times \$26{,}780 = \$1{,}472.90$

3a. $3\% \times \$12{,}833$

3b. $20\% \times \$9{,}384$

3c. $5\% \times 24{,}556$

3d. $40\% \times 16{,}789$

3e. $10\% \times 46{,}882$

3f. $12\% \times \$894$

Manufacturer's Suggested Retail Price

Most car buyers are familiar with a car's **MSRP (Manufacturer's Suggested Retail Price)**, or *sticker price*. This is the price printed on a sticker pasted on the window of a new car. The sticker also lists the equipment on the car and mileage information.

Car buyers do not usually pay the full MSRP for their car because of discounts given by the car dealer or manufacturer. A car in very high demand may sell for a price higher than the MSRP.

Buyer's Guide to Features

THOMSON MOTOR CAR COMPANY
Product Features: MR35 Sports Sedan, 2-door

Features	Model			Features	Model		
	STD	CTM	PRM		STD	CTM	PRM
Air bags	S	S	S	Power windows	NA	O	S
Air conditioning	S	S	S	Seats, cloth	S	S	S
Alarm system	O	O	O	Seats, leather	NA	NA	O
Cruise control	S	S	S	Side mirror, manual	S	NA	NA
Defogger, rear	S	S	S	Side mirror, electric	O	S	S
Engine, 4 cylinder	S	NA	NA	Ski rack	O	O	O
Engine, 6 cylinder	O	S	S	Sound, standard	S	NA	NA
Light package	S	S	S	Sound, deluxe	O	S	NA
Message center	NA	O	S	Sound, premium	O	O	S
Power brakes	S	S	S	Tilt steering	S	S	S
Power seats	O	O	S	Trim, bright	S	S	S
Power steering	S	S	S	Trim, color matched	NA	NA	O

Code: S–Standard; O–Optional; NA–Not Available

New Car Warranty On All Models: 12 Months or 12,000 Miles

In many car purchases, an important part of the process is **negotiation**, where the buyer and seller of the vehicle come to an agreed price for the vehicle. Other sellers may offer a "no-haggle" price, which indicates that the vehicle is priced as low as it will be sold and negotiation is not generally utilized.

Now assume that you are interested in buying the Thomson MR35, a small sports car. The features found on three MR35 models are shown above. By looking to the right of each feature, you can determine if the feature is standard (S), optional (O), or not available (NA) on each model.

The features listed in the table above are available on many cars. The buyer's guide you get from a new car dealer would list more options for you to consider.

Business *Tip*

New car warranties pay for the cost of correcting defects and making most repairs. The buyer is reponsible for routine care such as oil changes and replacing parts, such as brakes, that may wear.

The table below shows the MSRP base price for each MR35 model and the prices for longer warranties and optional features. The *base price* is the price paid for a model equipped with all the standard features shown in the buyer's guide. For example, the base price for the STD model is $23,208.

The basic new car warranty, abbreviated as 12/12,000, covers the car "bumper to bumper" for 12 months, or 12,000 miles, whichever comes first. The *extended warranty* provides extra coverage for the number of months and miles shown.

EXAMPLE 1

A customer wants to buy the MR35 Sports Sedan, STD model with the optional six-cylinder engine, the power seats, and the 36/36,000 extended warranty. Using the information from the MSRP list, find the price of this car.

Business *Tip*

When shopping for a new car, read reports found in libraries or through an Internet search that compare the repair and insurance costs and the safety features of various makes of cars. Also ask owners for their opinion about the car you may want and take a test drive to make sure the car suits your needs.

Manufacturer's Suggested Retail Price List

THOMSON MOTOR CAR COMPANY
MSRP: MR35, Sports Sedan, 2-door

Car Model	Base Price
Model STD	$23,208
Model CTM	$24,185
Model PRM	$25,096

Extended Warranty	Price
24 months; 24,000 miles	$240
36 months, 36,000 miles	$375
48 months, 48,000 miles	$575
24 months, 30,000 miles	$400
36 months, 45,000 miles	$585
48 months, 60,000 miles	$750

Optional Features	Price
Alarm system	$481
Engine, 6 cylinder	$796
Message center	$348
Power seats	$410
Power windows	$306
Seats, leather	$680
Side mirror, electric	$197
Ski rack	$365
Sound, deluxe	$187
Sound, premium	$246
Trim, color matched	$248

SOLUTION

Find the base price of the STD model. Then, add the base price and the cost of the optional features and extended warranty, if any.

$23,208 base price

$23,208
$ 796
$ 410
$ 375
$24,789 MSRP

✔ CHECK YOUR UNDERSTANDING

A. Loretta wants the MR35 PRM model with an alarm system and color matched trim. What is the MSRP of this car?

B. Jack is interested in the MR35, Model CTM, with the message center and ski rack. What is the car's MSRP?

Cost of New Car Purchases

The key items in a new car purchase are listed below.

PURCHASE PRICE The price negotiated by the dealer and the buyer. The price includes the car and any options installed by the dealer.

SALES TAX Tax computed on the purchase price.

REGISTRATION FEES License and title transfer fees.

NON-TAXABLE ITEMS Any items such as extended warranties that may be exempt from sales tax depending on state tax laws.

REBATES Discounts, if any, given by the manufacturer or car dealer.

DELIVERED PRICE Often called the "out-the-door" price. It is the total of the purchase price, sales tax, registration fees, and non-taxable items, less any rebates.

DOWN PAYMENT A cash payment made by the customer or the value of a vehicle given as a trade-in.

BALANCE DUE The amount the customer has left to pay. This amount is usually borrowed from the car dealer or other lender.

Use the following formulas, find the delivered price and balance due on a new car purchase.

Delivered Price = Purchase Price + Sales Tax + Registration Fees + Non-taxable Items − Rebates

Balance Due = Delivered Price − Down Payment

EXAMPLE 2

The purchase price on a new car bought by Gretchen Cerna is $23,340. She is charged a 5% sales tax on the purchase price. She received a manufacturer's rebate of $1,250. Registration costs were $128. Gretchen's down payment was a trade-in of $4,300 given for her old car. Find the delivered price and the balance due.

Photodisc/Getty Images

SOLUTION

Find the sales tax on the purchase price.

$5\% \times \$23{,}340 = 0.05 \times \$23{,}340 = \$1{,}167$ sales tax

Add the purchase price, sales tax, and registration costs.

$\$23{,}340 + \$1{,}167 + \$128 = \$24{,}635$

Deduct the rebate.

$\$24{,}635 - 1{,}250 = \$23{,}385$ delivered price

Subtract the down payment from the delivered price.

$\$23{,}385 - \$4{,}300 = \$19{,}085$ balance due

✔ CHECK YOUR UNDERSTANDING

C. Tim Garner and a car dealer agreed on a $20,067 price for a car. Tim then decided to buy an extended service warranty for $250 extra. He used his old license plates, but still had to pay registration and title fees of $134.85. A 4.5% state sales tax is charged on all purchases, except warranties. Tim made a cash down payment of $6,000. Find the delivered price and the balance due for this purchase.

D. Lillian Weinstein's purchase price for an economy car is $16,238. Sales tax is charged at 6% in her state. Plates, title transfer, and other fees totaled $186. Lillian made a down payment of 10% of the purchase price of the car. Find the delivered price and the balance due.

Cost of Used Car Purchases

Used cars may be purchased from new car dealers who resell trade-ins, used car dealers, car rental agencies, and individual car owners. The used cars are generally sold "as is," without warranty.

The *purchase price* for a used car refers to the price on which the buyer and the seller agree and is the price on which sales tax is figured.

The *delivered price* of used cars is equal to the sum of the purchase price, sales tax, and registration fees. The balance due is the delivered price less the down payment.

Business *Tip*

A used car seller may give a limited warranty to the buyer to make the sale. Buyers of used cars with part of the manufacturer's warranty still in effect are often allowed to transfer the warranty to their name.

EXAMPLE 3

The purchase price of a 3-year-old used car is $12,450. Other costs include registration fees of $128 and sales tax of 4%. The buyer made a down payment of $3,800. What is the delivered price of the car and the balance due?

SOLUTION

Find the sales tax on the purchase price.

$4\% \times \$12{,}450 = 0.04 \times \$12{,}450 = \$498$ sales tax

Add the purchase price, sales tax, and registration fees.

$\$12{,}450 + \$498 + \$128 = \$13{,}076$ delivered price

Subtract the down payment from the delivered price to find the balance due.

$\$13{,}076 - \$3{,}800 = \$9{,}276$ balance due

✔ CHECK YOUR UNDERSTANDING

E. Arnold Knapp agreed to buy a 1-year-old car for $16,500 cash. Sales tax of 7% is charged on the sale. Other costs included license plates, $85; title transfer, $47. What was the total cost of the car?

F. The purchase price of a used van bought by Frances Sauger was $11,370. She paid $200 extra for a 2-year warranty on the transmission. In her state, warranties are exempt from the 5% sales tax charged on merchandise. Registration costs were $129. What is the balance due that Frances needs to finance if she makes a down payment of 25% of the purchase price?

Wrap Up ▶ ▶ ▶

People who need a car now and have little money must buy a car on the monthly payment plan. Those who are able to save money and pay cash for a car earn interest on their savings and do not pay interest on their loan. The best way is the one that fits the circumstances.

TEAM Meeting

Visit the "make your own car" portion of the web site of one of the major car manufacturers. Select three different car lines and find the price of the most basic model within each car line. Then find the price for the same basic model with every option. Prepare a chart showing the prices you found and calculate the amount and percent of increase from the lowest to the highest prices in a car line. Share your findings with the rest of the class.

Exercises

Find the sum or difference.

1. $18,458 + $239
2. $456 + $318 + $148
3. $28,346 − $7,086.50
4. $34,829 − $14,340

Find the product.

5. 4% × $36,784
6. 30% × $29,006

Use the buyer's guide and MSRP table given in the lesson to solve Exercises 7–11. (Hint: For Exercises 7–10, if the features the customer wants are either standard features or are not available for the model, do not include their cost in the MSRP you calculate.)

	Car Model	Features Wanted	Warranty Wanted	MSRP
7.	STD	alarm system, air conditioning, tilt steering	24/24,000	
8.	PRM	color matched trim, leather seats	48/60,000	
9.	CTM	premium sound, alarm system, leather seats	12/12,000	
10.	PRM	power package: brakes, seats, steering, windows	48/48,000	

11. A customer wants to buy the STD model with the three features that are standard on the CTM model but optional on the STD model. Would the customer save money by buying the base CTM model instead? If so, how much would be saved?

Solve.

12. The purchase price of a new car bought by Kay Terchek is $30,875. The car's MSRP was $32,560. Her other costs were: sales tax at 7%, non-taxable extended warranty at $390, registration fees at $128. Kay got a $250 rebate and made a $4,300 down payment. What was the delivered price of the car and the amount due?

13. Herman Ollender's purchase price for a new car was 95% of the $21,400 MSRP. Sales tax was figured at 5%. Registration fees totaled $284. He received a customer loyalty rebate of $500. A trade-in value of $3,170 for Herman's old car was used for the down payment. Find the car's delivered price and the amount due.

14. A new car's usual purchase price of $21,480 was reduced by $1,007 because it had been used as a demonstrator car. Eugene Basanese paid a 3.5% sales tax, registration fees of $172, and made a $3,200 down payment. What is the balance due on the car?

15. A used car's price is $4,850. The buyer pays a combined city/state sales tax of 4.6%. Registration fees are $85 for license plates and $31 for title transfer. If the buyer pays for the car in cash, how much will be due?

16. A car that was bought for $23,700 nine years ago was offered for sale at $4,125. Because the car had some body rust, the buyer asked the seller to reduce the price by $350. The seller agreed. The buyer paid $167 in registration fees and a 6% sales tax. What was the total cost of this car to the buyer?

17. **CRITICAL THINKING** Tom believes that most new cars are very reliable and should run with no problems for 125,000 miles. He also believes that buying extended warranties is a waste of money since they will never be needed. What do you think?

18. **FINANCIAL DECISION MAKING** Betty is offered $7,400 for her old car as a trade-in on a new car. She looks in the want ads and sees that many cars the same age as hers sell for up to $3,000 more. Should Betty trade the car or try to sell it herself for a higher price?

Mixed Review

19. Round 10.09 to the nearest tenth and to the nearest unit.

20. Multiply $5\frac{1}{4}$ by $2\frac{1}{3}$

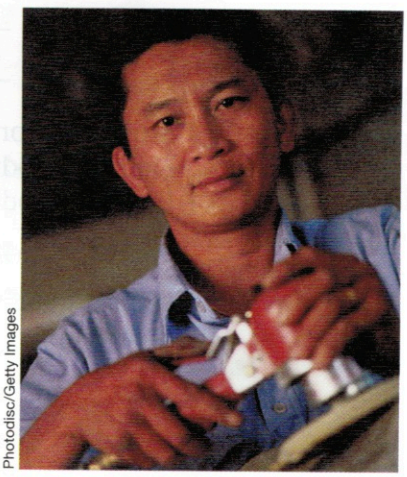
21. $2{,}142 \div 9$

22. Rewrite $1\frac{1}{8}$ as a decimal.

23. 0.17×0.34

24. Colin Marshall's credit card has an APR of 15% and uses a monthly periodic rate. His balance subject to finance charge is $542.75. How much is the finance charge for one billing cycle?

25. Frank Rozier worked five days last week and was paid a per diem rate of $109.50. If his workday is 7.5 hours, how much does Frank earn per hour of work?



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6-6

Car Purchases and Leases

GOALS

- Calculate the total amount paid and the finance charge for installment loan car purchases
- Calculate the cost of leasing cars
- Compare the costs of leasing and buying cars

KEY TERMS

- lease

Start Up ▶ ▶ ▶

Bobbi tells you that she doesn't like her family's cars because they are kept too long, for 8–10 years. She claims that she will always lease cars so she can drive a new car all the time. She asks you whether you agree with her. What would you say?

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Math Skill Builder

Review these math skills and solve the exercises that follow.

1 **Add** money amounts.
Find the sum. $\$24{,}875 + \$3{,}100 + \$450 = \$28{,}425$

1a. $\$180 + \$570 + \$43$

1b. $\$24{,}765 + \$1{,}250$

1c. $\$562 + \$19 + \$1{,}235$

2 **Subtract** money amounts.
Find the difference. $\$34{,}279 - \$33{,}892 = \$387$

2a. $\$18{,}367 - \$17{,}907$

2b. $\$38{,}431 - \$8{,}400$

2c. $\$64{,}395 - \$16{,}338$

3 **Multiply** money amounts by whole numbers and percents.
Find the product. $24 \times \$582 = \$13{,}968$
Find the product. $13\% \times \$16{,}300 = 0.13 \times \$16{,}300 = \$2{,}119$

3a. $48 \times \$648$

3b. $60 \times \$610.45$

3c. $21\% \times \$19{,}250$

3d. $17\% \times \$9{,}670$

3e. $64 \times \$19.95$

3f. $35\% \times \$13{,}842$

Financing Car Purchases

The delivered price of a car purchase may be paid in cash. Most buyers, however, make a down payment and take out an installment loan.

EXAMPLE 1

The delivered price of Lydia Zollner's new car is $23,560. She makes a $2,000 down payment and pays the balance in 48 monthly payments of $560. What total amount did Lydia pay for the car? What was the finance charge?

SOLUTION

Add the total of the monthly payments and the down payment.

$48 \times \$560 = \$26{,}880$ $\$26{,}880 + \$2{,}000 = \$28{,}880$ total paid

Subtract the cash price from the total paid.

$\$28{,}880 - \$23{,}560 = \$5{,}320$ finance charge

✔ CHECK YOUR UNDERSTANDING

A. Steve Ruhlin bought a used truck for $9,650. He paid for the truck with a $2,650 down payment and 36 monthly payments of $234.30. What total amount did the truck cost?

B. Iris DiNeise bought a luxury car for $47,851 and made a $4,500 down payment. She got a special loan rate of 2.1% for 60 months. Iris' monthly payments were $761.74. What was her finance charge on this car?

Costs of Leasing

People who lease cars sign a lease. A **lease** is a contract made between the company that owns the car (the lessor) and the person who will be given the right to use the car (the lessee). Leasing a car is similar to renting a car. You use the car for a time and once the lease period is over you turn in the car and walk away.

Before signing a lease, be sure you understand the lease contract, including how many miles you are allowed to drive the car each year.

A LEASE CONTRACT Leasing is based on the idea that you agree to make a monthly payment that covers the depreciation, finance charges, prepaid mileage, and other fees. An additional payment may also be required at the time the lease is signed. The typical lease contract includes these items:

LEASE PRICE The price negotiated by you and the dealer. It is the price on which the monthly lease payments are usually figured.

DOWN PAYMENT This is an amount that may be required by the lease contract or voluntarily paid by a buyer. A down payment reduces the lease price and results in smaller monthly lease payments.

RESIDUAL VALUE The expected value of the car at the end of the lease period. This may also be thought of as the depreciated value of the car.

Business *Tip*

Most leases are closed-end leases that have a fixed residual value regardless of what the market price of the car may be at the lease end.

INTEREST RATE The rate used to compute the finance charge.

LEASE TERM The length of the lease, usually stated in months.

SECURITY DEPOSIT Money held by the dealer to pay for any possible damage to the leased car. The security deposit is refundable.

LOAN FEE A charge for processing the lease contract and making credit checks.

REGISTRATION FEES The cost of license plates and title registration.

MILEAGE ALLOWED The number of miles the car may be driven each year for the term of the lease.

When you lease a car you must buy insurance and pay for gas, oil, and other routine maintenance expenses.

EXAMPLE 2

Jay Sluman leased a car at $307 a month for 48 months with a $995 down payment. At the end of the lease he was charged $0.22 a mile for the 2,800 miles he drove over his lease mileage allowance. What were his total lease costs?

SOLUTION

Find the total of the monthly lease payments and the excess miles charge. Add the two answers to the down payment.

$48 \times \$307 = \$14{,}736$ total lease payments

$\$0.22 \times 2{,}800 = \$616$ excess miles charge

$\$14{,}736 + \$\,616 + \$995 = \$16{,}347$ total lease costs

✔ CHECK YOUR UNDERSTANDING

C. Candace Ortisi had a two-year car lease with $528 monthly payments. Her lease had a mileage limit of 12,000 miles a year and charged 20 cents a mile for each mile over the limit. Her total mileage for the two years was 30,850 miles. What was the total cost of the lease over its term?

D. Terrance Duggan's 4-year lease cost $332 a month and allowed him to drive 12,000 miles a year. He bought 3,000 extra miles each year for an additional charge of 7 cents a mile. Lease processing fees and a down payment totaled $418. What was the four-year cost of the lease?

Compare Leasing and Buying

When you buy a car you pay for its total cost and end up owning a car that still has some value. When you lease the car you pay for only part of its cost, so your monthly payments are lower, but you have no ownership claim on the car.

When you lease a car you have the option to buy the car at the end of its lease. The price you would pay is the *residual value,* which is the estimated value of the car. The method used in this book to compare leasing and buying will be to calculate the total cost of buying the car under both plans.

EXAMPLE 3

Wilbur Frye and his dealer negotiated a price of $27,400 for a new car. Wilbur can lease the car for $496 a month for 36 months and buy it at the end of the lease for its residual value of $16,200. If he buys the car now his monthly loan payment will be $822 for three years after making a $2,000 down payment. What is the total cost of purchasing the car under each plan? Which plan is less expensive?

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SOLUTION

Find the total of the monthly lease payments. Then, add the residual value and the down payment, if any.

$36 \times \$496 = \$17{,}856$ total lease payments

$\$17{,}856 + \$16{,}200 = \$34{,}056$ total cost to purchase leased car

Find the total of the monthly loan payments, add the down payment amount, and find the difference.

$36 \times \$822 = \$29{,}592$ total monthly loan payments

$\$29{,}592 + \$2{,}000 = \$31{,}592$ total cost to purchase outright

$\$34{,}056 - \$31{,}592 = \$2{,}464$ difference between two costs

The outright purchase cost is $2,464 less expensive.

✔ CHECK YOUR UNDERSTANDING

E. A car that costs $18,500 can be leased for $436 monthly with a $500 down payment and an $11,000 residual value. The monthly loan price cost is $728 with a $3,100 down payment. The lease and loan terms are 24 months. Which is less expensive, leasing or buying, and how much less?

F. A car that sells for $37,960 today is expected to have a residual value of $19,050 in four years. With a $3,800 down payment the loan payments for four years will be $873 monthly. The monthly lease price for four years with a $995 down payment is $623. Does leasing or buying cost more? How much more?

NETBookmark

Select the car you would most like to own. You can find web sites on the Internet that rank cars by the number of miles per gallon they get. List the names and mileage information for four cars: the car you selected, the most efficient car, the least efficient car, and the average car. Assume that all the cars will be driven 15,000 miles in a year and their owners will buy fuel at your local gas station. Calculate how much would be spent per year on fuel for each car listed. Write a one-page report, including a chart, about your findings.

Wrap Up ▶ ▶ ▶

Having a fairly new car all the time is one of the appealing features of leasing if you are willing to pay the cost. Bobbi should realize that her family has to make a choice on how they spend their money. Perhaps they know that buying and keeping a car for 10 years costs less than leasing 5 different cars for 2 years at a time.

Exercises

Find the sum.

1. $47 + $167 + $476

2. $12,450 + $1,250 + $1,800

Find the difference.

3. $31,374 − $29,857

4. $26,473 − $23,826

Find the product.

5. 72 × $457

6. 24 × $518

7. 14% × $21,560

8. 11% × $19,870

Solve.

9. Maggie Holden's 2-year car lease costs $597 a month. She had to pay a $600 security deposit that she got back at the end of the lease. She made a down payment of $500 and paid fees of $125 to get the lease. What was the net cost of the lease to Maggie at the end of the lease?

10. A 3-year lease costs $324 a month and a 2-year lease costs $392 a month for the same car. On the lease signing date Matt Grove makes a $990 down payment and pays lease application costs of $175. How much more would Matt pay for leasing during the first year under the more expensive plan?

11. A car that costs $20,990 can be bought for $1,800 down and 48 monthly loan payments of $488. It can be leased for $354 a month for 48 months with $760 down and a residual value at lease end of $9,445. Looking at the total purchase costs, will buying or leasing cost more? How much more?

12. The monthly payment is $356 for a 36-month lease with a $250 down payment for a car that sells for $18,042. Its residual value is $10,284. With a $1,700 down payment, the monthly payments on a 36-month loan would be $546. Compare the total purchase costs of leasing and buying. Which costs more, and how much more?

Amy Stiles bought a new car for $24,300. She made a $1,800 down payment. Her monthly loan payments for four years are $569. Had she bought the car two months later and made the same down payment, she would have received a $1,250 rebate that would have lowered her monthly loan payments to $538.

13. What total amount will she pay for the car?

14. What total amount would she have paid if she could have received the rebate and the lower loan payment rate?

Mike Huber is buying a car for $24,300. He wants to make a maximum down payment of $3,000. Two deals are available, both for 48-month loans. In the first deal, with a factory rebate his down payment will be $1,000. His monthly loan payments would be $573.21 at 8.4% interest. In the second deal, he gets no rebate and makes a $3,000 down payment, but his interest rate is 0.9% resulting in a $451.95 loan payment.

15. What total amount will Mike pay with the first deal?

16. What total amount will Mike pay with the second deal?

17. **FINANCIAL DECISION MAKING** A dealer offers you a 2-year lease with no money down at $675 a month for a car that costs $29,100. The estimated residual value of the car is $18,915 at the end of the 2-year lease. You want to buy the car over four years with a $1,200 down payment. The monthly loan payment would be $712. What is the difference between the total cost of buying the car under both plans? Would you choose the less expensive plan?

18. **CRITICAL THINKING** When you lease a car you are responsible for returning the car in good condition with only the normal amount of wear and tear. How would you define what is normal "wear and tear?" Do you think your lease contract defines it in the same way?

Mixed Review

19. Estimate. Then, find the actual quotient of 27,414 ÷ 9

20. Divide 4.37 by 0.023.

21. $7\frac{1}{2} + 1\frac{3}{5}$

22. Divide 5,639 by 0.1 and by 1,000.

23. $48.32 decreased by $\frac{1}{8}$ of itself

24. $52.44 increased by $\frac{1}{3}$ of itself

25. $19.45 decreased by $\frac{2}{5}$ of itself

26. The exact interest charge per $100 is $0.8630 at $10\frac{1}{2}\%$ interest for 30 days and $0.4315 per $100 for 15 days. What interest will be paid on a $700 loan for 45 days at $10\frac{1}{2}\%$?

27. A home entertainment center sells for $3,200 cash. It may be purchased for $400 down and monthly payments of $89 for 48 months. By what percent is the installment price greater than the cash price? Round to the nearest tenth percent.

28. Mike Ruskey's charge statement showed these figures: previous balance, $346.90; new balance, $684.70; cash advance limit, $750; credit limit, $1,250; minimum payment due, $19.12. If Mike makes the minimum payment, what is the most he can charge next month and not exceed his credit limit?

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6-7

Depreciating a Car

GOALS

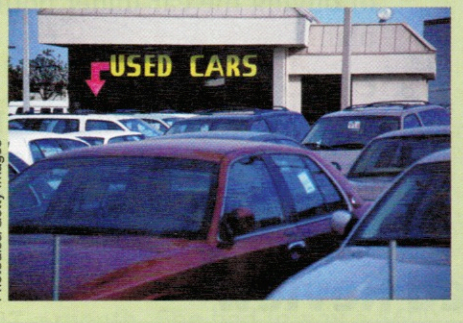
- Calculate average annual depreciation on a car
- Calculate the rate of depreciation

KEY TERMS

- resale value
- trade-in value

Start Up

What do you think has more value: a 3-year-old car with 30,000 miles or a 1-year-old car of the same make and model with 80,000 miles? List at least one source where you could verify your answer.



Photodisc/Getty Images

Math Skill Builder

Review these math skills and solve the exercises that follow.

1. **Divide** money amounts by whole numbers.
Find the quotient. $\$14{,}240 \div 8 = \$1{,}780$

1a. $\$23{,}580 \div 9$ **1b.** $\$12{,}438 \div 3$

2. **Divide** money amounts by money amounts to find a percent.
Find the percent, to the nearest tenth. $\$540 \div \$10{,}500 = 0.0514$, or 5.1%

2a. $\$1{,}260 \div \$9{,}400$ **2b.** $\$5{,}200 \div \$28{,}600$

Average Annual Depreciation

A car loses value as it grows older. This loss of value is called *depreciation*. The total depreciation on a car is the difference between its original cost and its resale, or trade-in, value. **Resale value** is the market value, or the amount you get when you sell the car to someone else. The **trade-in value** is the amount you get for your old car when you trade it in to buy a new car.

Depreciation = Original Cost − Trade-in or Resale Value

When you buy a car, you can only estimate what the depreciation will be. The actual amount of depreciation will be known only when the car is sold or traded in. However, by making some good guesses about your car's future value, you can calculate the estimated *average annual depreciation*.

To calculate the *estimated* average annual depreciation on a car or other motor vehicle follow these steps:

1. Estimate the number of years the car will be kept.
2. Estimate the value of the car when it is resold or traded in.
3. Subtract trade-in or resale value from the original cost to estimate total depreciation.
4. Divide the total depreciation by the number of years the car will be kept.

Business Tip

Cars depreciate much more quickly in their first few years of use than in their last years of use. Cars with many defects or those of poor design will depreciate even more quickly. Cars of high quality depreciate less.

To calculate the *actual* average annual depreciation, also follow these four steps, keeping in mind that you are using actual, not estimated, amounts. For example, you do not have to estimate the length of time you keep the car or its resale or trade-in value. You use the actual time and dollar amounts.

You can use the following formula to find estimated and actual average annual depreciation.

$$\text{Average Annual Depreciation} = \frac{\text{Original Cost} - \text{Trade-In or Resale Value}}{\text{Number of Years}}$$

EXAMPLE 1

LaWanda Turgill bought a car for $14,800. She estimates its trade-in value will be $5,800 at the end of 4 years. Find the estimated total and the estimated average annual depreciation of the car.

Business Tip

Go to used car web sites to get data that will help you find the estimated depreciation for a car.

SOLUTION

Subtract the estimated trade-in value from the original cost.

$\$14{,}800 - \$5{,}800 = \$9{,}000$ estimated total depreciation

Divide the estimated total depreciation by the number of years.

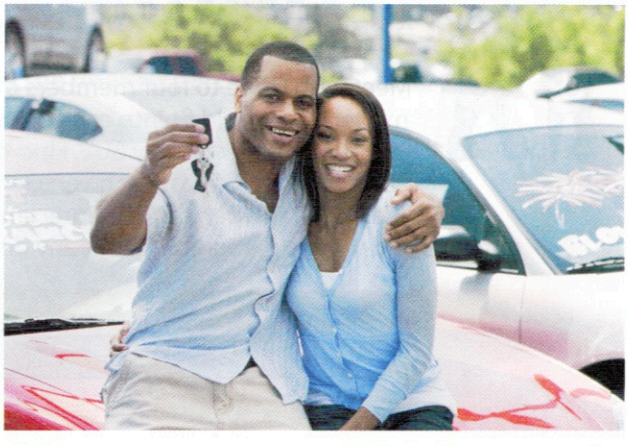
$\$9{,}000 \div 4 = \$2{,}250$ estimated average annual depreciation

✔ CHECK YOUR UNDERSTANDING

A. Roland Corbett bought a new car for $19,500. He has been told that his car will probably be worth $9,800 at the end of two years. What will be his estimated total and average annual depreciation for two years?

B. Genevieve Prekova bought a car 9 years ago for $14,130. She sold it recently for $1,800. What was the total and average annual depreciation on the car?

When the average annual depreciation is calculated as it was in Example 1, this is called the *straight-line method.* It assumes the car depreciates the same amount each year.



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Rate of Depreciation

When the straight-line method of finding depreciation is used, the average annual depreciation may be shown as a percent of the original cost. The percent is called the *rate of depreciation.*

Rate of Depreciation = Average Annual Depreciation ÷ Original Cost

EXAMPLE 2

A $12,000 car is sold 3 years later for $6,960. What is the rate of depreciation?

SOLUTION

Find the total depreciation.

$12,000 − $6,960 = $5,040

Find the average annual depreciation.

$5,040 ÷ 3 = $1,680

Divide the annual depreciation by the original cost to find the rate of depreciation.

$1,680 ÷ $12,000 = 0.14, or 14% rate of depreciation

✔ CHECK YOUR UNDERSTANDING

C. A new car that cost $23,000 is worth $16,100 a year later. What was the rate of depreciation for the one year?

D. Billy Macon sold his car for $368. He paid $9,200 for the car when he bought it 12 years ago. What was the annual rate of depreciation?

Wrap Up ▶ ▶ ▶

The value of a used car depends not only on its age and the miles it has been driven, but also on its overall condition and how it has been maintained. After the two cars are seen and their service records examined, their true value is determined by what price they will bring in the market. The Kelley Blue Book is one source that provides used car pricing information. You may also want to look at the want ad prices for similar cars or check the prices posted on used car web sites or the Blue Book site.

TEAM Meeting

Meet with three to four members of your class and select one specific make and model that would fit into each of these vehicle categories: luxury car, luxury SUV, economy car, economy SUV. Find the approximate selling price of each vehicle a year ago and what each vehicle would sell for today as a one-year-old vehicle. Calculate the percent of depreciation for each vehicle. Study the depreciation percents and write a paragraph about any differences you find.

Exercises

Find the difference or quotient.

1. $28,459 − $14,286
2. $34,120 − $20,875
3. $16,457 ÷ 7
4. $18,372 ÷ 12

Find the percent, to the nearest percent.

5. $2,368 ÷ $18,300
6. $1,280 ÷ $15,340

Find the total depreciation.

	Type of Vehicle	Original Cost	Resale or Trade-in Value	Total Depreciation
7.	Mid-size Car	$21,606	$9,375	
8.	Sports Utility	$28,461	$12,225	
9.	Pickup Truck	$14,187	$1,560	
10.	Luxury Car	$43,597	$20,150	
11.	Mini Van	$20,500	$12,800	

Solve.

12. Brandon Merritt paid $11,300 for a car 7 years ago. He bought a new car recently at a total cost of $11,100 after deducting the $950 he got as a trade-in for his old car. What was the total depreciation on the 7-year-old car?
13. A bakery bought a truck for $21,088. After four years a new truck was bought that cost $23,420. A trade-in value of $4,790 was given for the old truck. To the nearest dollar, find the average annual depreciation of the old truck.
14. A van that costs $24,444 is estimated to be worth $6,300 after four years. Find the rate of depreciation on the van, to the nearest percent.

Find the average annual depreciation for each.

	Original Cost	Resale or Trade-in Value		Average Annual Depreciation
		At end of	Amount	
15.	$12,800	3 years	$6,710	
16.	$23,100	7 years	$7,210	
17.	$19,750	2 years	$10,120	
18.	$28,980	5 years	$10,800	

Find the rate of depreciation. Round answers to the nearest percent.

	Original Cost	Resale or Trade-in Value		Rate of Depreciation
		At end of	Amount	
19.	$14,500	4 years	$5,600	
20.	$28,350	3 years	$14,700	
21.	$9,450	6 years	$1,800	
22.	$12,680	2 years	$7,700	

Trudy Winslow bought a car for $8,850 three years ago. A car dealer offered Trudy $3,825 as the trade-in value, but she feels she can sell the car for $4,500.

23. What will be the average annual depreciation if she takes the trade-in offer?

24. What will be the average annual depreciation if she is able to sell the car at the price she wants?

25. **STRETCHING YOUR SKILLS** Nora sold her car for $3,100 after owning it for five years. She found the average annual depreciation was $1,860 and the rate was 15%. What did Nora pay for the car when it was new?

26. **CRITICAL THINKING** A new car may depreciate as much as 35% of its original cost in the first year of use. Would it make more sense not to buy the car new but to wait one year and buy it used for less money?

Mixed Review

27. Find the average of 8, 11, 15, 3, and 27.

28. $\frac{5}{6} - \frac{2}{3}$

29. $\frac{2}{9} + \frac{11}{18}$

30. $\frac{7}{12} \div \frac{5}{6}$

31. Nell Burton borrows $4,500 at 6% banker's interest for 24 days. What amount of interest does she pay?

32. Alex Sims borrowed $750 on a one-year simple interest installment loan at 18%. His monthly payment on the loan was $68.76. Find the amount of interest, amount applied to the principal, and new balance for the first monthly payment.

33. Ella Rankin sells printer paper to retail stores. She is paid a commission of 1.25% on all sales for a month. What are her commission earnings for a month where her sales are $382,000?

34. You have a monthly income of $2,400. Your monthly mortgage payment is $550. Your credit card minimum payment is $55, and you have other monthly loan obligations of $385. To the nearest percent, what is your debt-to-income ratio?

Last year, Chandna Venkatraman was paid a salary of $700 a week for 52 weeks. Her federal taxable income for the same period was $21,200. She paid to the city of Carthage in which she worked an income tax of 3.5% on her taxable income. She could have worked at another firm in the city of Hamden. Her annual salary at the other firm would have been $39,000. The city in which the other firm is located charges an income tax of 1.8% on the gross salary.

35. In which city would Chandna have paid more city income taxes?

36. How much more money would she have paid in city income taxes?

37. Lori Schneider can buy a large TV for $700 cash. On the installment plan, Lori must make a down payment of $100 and pay $54.50 for 12 months. How much more is the installment price than the cash price?

38. Gilbert Conroy withdrew $200 from his bank's ATM. On a shopping trip he bought an office chair for $120.87 in cash and paid $75.11 cash for groceries. He then used his ATM card to pay for: $136.50 in painting supplies; $66.52 for lawn mower repair. What amount was left in Gilbert's account if it had a balance of $740.12 at the start of the day?

6-8

Cost of Owning a Car

GOALS
- Calculate car insurance premiums
- Find the cost of operating cars

KEY TERMS
- bodily injury
- property damage
- collision
- comprehensive damage

Start Up ▶▶▶

Insurance companies charge young drivers below age 25 much higher premiums for insuring their cars than they would older drivers. What factors do you think they especially consider in setting their rates for young people?

Photodisc/Getty Images

Math Skill Builder

Review these math skills and solve the exercises.

1. **Rewrite** a percent as a decimal. Rewrite as a decimal. $80\% = 0.8$

1a. 25% **1b.** 5%

2. **Multiply** money amounts by percents.
Find the product. $20\% \times \$387 = 0.20 \times \$387 = \$77.40$

2a. $5\% \times \$468$ **2b.** $10\% \times \$763$

Car Insurance

There are four basic types of insurance or coverage for motor vehicles that protect you against the risk of financial loss:

Bodily injury Covers your liability for injury to others.

Property damage Covers damage to other people's property, including their vehicles.

Collision Covers damage to your own motor vehicle.

Comprehensive damage Covers damage or loss to your vehicle from fire, theft, vandalism, hail, and other causes.

Business *Tip*

The minimum car insurance you must carry by law for bodily injury and property damage may not offer the financial protection you need.

States require car owners to carry minimum amounts of car insurance. Some states combine bodily injury and property damage coverage into one minimum amount of insurance required. The insurance applies regardless of whether there is injury to one or more persons or whether there is damage to property of others in a single accident.

In addition to requiring minimum amounts of the basic types of insurance coverage, states may require car owners to carry additional coverage.

A car owner may be required to buy *uninsured* and *underinsured motorists insurance*, which protects against damage to the car or injury to persons in the car caused by a driver who carries no or insufficient insurance.

Premiums for automobile insurance may vary from state to state and within a state. Each insurance company sets its own rates following state regulations. Premiums may be higher in large cities than in small cities and rural areas. Premiums may also be higher on cars used for business than those used for pleasure driving. Premiums are usually higher for drivers under 25 years of age than for those over 25.

Business *Tip*

A bodily injury coverage limit of $25/50,000 means a maximum of $25,000 per person, and $50,000 per accident will be paid by the insurance company.

Sample car insurance annual premiums are found in the table below. As you study the table, notice how the premium changes depending on the use of the car, the coverage limits, and the deductible amount.

Sample Annual Car Insurance Premiums

Type of Insurance Coverage	Coverage Limits	Annual Premiums for: Pleasure Use Only	Driving to Work	Business
Bodily Injury	$25/50,000	$ 20.58	$ 22.84	$ 29.71
	50/100,000	30.88	34.27	44.68
	100/300,000	53.95	59.35	79.74
Property Damage	$25,000	$ 135.80	$ 150.74	$ 196.50
	50,000	161.67	179.44	233.92
	100,000	190.19	211.11	274.44
Collision	$100 deductible	$ 466.53	$ 517.84	$ 574.70
	250 deductible	324.03	358.24	461.81
	500 deductible	261.95	290.77	378.01
Comprehensive	$50 deductible	$ 125.32	$ 137.85	$ 179.21
	100 deductible	93.99	104.33	135.62

EXAMPLE 1

Emma Jane Cooke wants a basic insurance policy for her car that she uses only for pleasure driving. She chooses this coverage: bodily injury, $25/50,000; property damage, $25,000; collision, $500 deductible; comprehensive, $100 deductible. Using the rates in the premiums table above, what annual premium will Emma Jane pay for car insurance?

SOLUTION

Find the premiums in the pleasure use only column.

$\$20.58 + \$135.80 + \$261.95 + \$93.99 = \$512.32$ annual premium

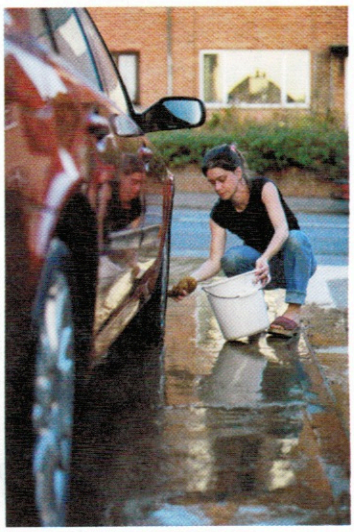
✔ CHECK YOUR UNDERSTANDING

A. Oliver Trainor insures the car that he drives to work. His coverage is \$25/50,000 bodily injury, \$50,000 property damage, \$250 deductible collision, and \$100 deductible comprehensive. Using the premiums shown in the premiums table, what will be Oliver's annual car insurance premium?

B. Harriet Driscoll's car is insured for business use. She chooses the highest coverage limits for bodily injury and property damage and \$100 deductibles for both collision and comprehensive. Using the rates shown in the premiums table, what is her annual premium?

Costs of Operating Cars

The total operating cost for a car is the sum of all the annual expenses of using the car. These expenses may include insurance, gas, oil, license and inspection fees, tires, repairs, garage rent, parking fees, taxes, and general upkeep. They also include depreciation and interest lost on a down payment.



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EXAMPLE 2

Gerri Forbes paid \$18,700 for her car. Her annual payments for insurance, gas, oil, repairs, and other expenses total \$2,300. The car depreciates 16% a year. Gerri could have earned \$145 interest on her investment in the car. What was her total annual cost of operating the car?

SOLUTION

Find the annual depreciation on the car. Then add to that amount the annual expenses and lost interest.

$16\% \times \$18{,}700 = 0.16 \times \$18{,}700 = \$2{,}992$ annual deprecation

$\$2{,}992 + \$2{,}300 + \$145 = \$5{,}437$ annual cost of car operation

✔ CHECK YOUR UNDERSTANDING

C. Conrad bought a used car for \$12,480. His expenses for the first year were gas and oil, \$1,070; repairs, \$512; insurance, \$981; license plates, \$83; loss of interest on his car investment, \$561; and depreciation, 12%. Find the total operating cost for the year, rounded to the nearest dollar.

D. Ester McHugh, a high school student, bought an old, used car for \$600. Her expenses for the year were gas, \$610; maintenance and repairs, \$780; property damage and liability insurance, \$630; license plates, \$63; depreciation, 10%; and lost interest, \$15. What was Ester's annual cost of operating the car?

Wrap Up ▶ ▶ ▶

Insurance companies base their insurance rates on statistics that show that young drivers in the 16–25 years age group are more likely to be involved in accidents, especially fatal accidents. Higher rates are charged to cover the increased damage payments insurance companies will have to make for the young driver group as a whole compared to the general population. Some companies decrease their rates for good students and for those who have taken approved driver's education training.

TEAM Meeting

Form a small group and find out what types and amounts of car insurance are required in the state in which you live. Contact a local insurance agent or your state's car registration office, or search insurance web sites to access the information you need. Present your findings to the class.

Exercises

Write as a decimal.

1. 5%
2. 2.5%
3. 10.35%
4. 0.7%
5. 105%
6. $6\frac{1}{2}\%$

Find the product. Round to the nearest cent.

7. $2\% \times \$563.98$
8. $3\frac{1}{4}\% \times \$762.37$

For the car insurance problems in this textbook, use the premiums table to find the cost of insurance. If the insurance coverage is not given, assume it is one of these standard coverages: bodily injury, $25/50,000; property damage, $25,000; collision, $100 deductible; comprehensive, $50 deductible. The same rate will apply to all types of motor vehicles unless otherwise indicated.

9. What is the total premium for standard insurance coverage on a car driven to work?
10. On a truck he drives to work, Norbert carries bodily injury insurance of $50/100,000 and $250 deductible on collision. Other coverage is standard. Find his annual premium.

June Driscoll uses her truck for business and insures the truck with standard coverage.

11. What annual premium does she pay?
12. If June took the highest deductibles, what amount would she save annually on her total car insurance bill?

Solve.

13. Wasaburo Sumida owns two cars. One car, used for pleasure only, is insured at standard coverage. His business car is insured for the greatest amount of bodily injury and property damage coverage and the highest deductibles. Because he insures both cars with the same company, he gets a 10% discount on his total premium. Find the premium for insuring both cars for one year.

14. Because of her three speeding tickets, Louella Burchette cannot get car insurance unless she pays a premium of 2.2 times the rate for standard coverage. She uses her car to drive to work. What is her premium for one year?

15. Owners of cars with antilock brakes and an alarm system get a 3.5% discount on their total insurance premium. What premium would they pay for standard coverage if they used their car to drive to work?

16. A truck used on a farm is insured at the same rate as if it were being driven to work. It has standard coverage with the highest deductibles. Since the truck is seldom driven outside the farm, it can be insured for 70% of the usual rate. Find the annual premium.

Nancy Tripp/Shutterstock.com

17. Vicki Dirkel paid $5,700 for her car. Her annual payments for insurance, gas, oil, repairs, and other expenses total $1,600. The car depreciates 8% a year. Gerri could have earned $57 interest on her investment in the car. What was her total annual cost of operating the car?

18. After buying a car for $12,230, JoAnn Zimmer estimates her first-year car expenses as: gas, $1,458; maintenance and repairs, $312; license plates, $64; insurance, $511; depreciation, 10% of the car's purchase price; lost interest, $305. Find JoAnn's total cost of operating the car for the first year.

Karl Trattner is 16 years old and owns his car. Because of his age and the type of car he owns, Karl must pay four times the usual rate for his insurance.

19. What annual premium must he pay for pleasure driving with standard coverage?

20. To reduce the amount he must pay, Karl is considering not covering his car for collision and comprehensive damage. What would be his annual premium with this reduced coverage?

21. **CRITICAL THINKING** Insurance companies offer discounts to owners of cars that have features such as air bags, anti-lock brakes, and alarm systems. How can they justify giving such discounts?

22. **CRITICAL THINKING** Insurance companies may charge higher rates to very old drivers or give them insurance with restrictions, such as allowing them to drive only in daylight hours. Is this a form of age discrimination?

23. **FINANCIAL DECISION MAKING** A car that you drive to work is worth about $1,200. If you did not insure your car for comprehensive and collision coverage, you would save about $500 a year in insurance costs. Should you drop these two coverages to save money?

24. **STRETCHING YOUR SKILLS** The IRS allows taxpayers to deduct the expense of operating a vehicle for business purposes. The taxpayer can keep records documenting the miles driven for business and the annual expenses for the vehicle and deduct the percentage of expenses based on the percentage of miles that were driven for business. Or, the taxpayer can use the standard deduction of 55 cents per mile. Jason Selvidge calculated his annual deductible expenses for his car to be $4,800. He drove his car a total of 16,000 miles during the year, and 10,000 of those miles were for business. How much of his actual expenses can he deduct? How much could he deduct if he takes the standard deduction?

Mixed Review

25. $12 \div \frac{1}{4}$

26. Rewrite 1.75 as a percent.

27. $1,236 + $0.78 + $12.37 + $672.99 + $5.82

28. Round to the nearest cent: $0.876, $15.027, $45.514

29. Marcus Ridley signed a promissory note for $10,200 at 9% ordinary interest for 180 days. Find the interest and amount due he will pay when the note is due.

30. Find the number of days from March 18 to July 5.

Delphine Salmer's credit card statement for August showed a previous balance of $658.18, new purchases and fees of $583.10 posted on August 10, and payments and credits of $218.40 posted on August 22. Her charge card company's monthly APR is 1.5%, and the company uses the previous balance method to figure the finance charge.

31. What is Delphine's finance charge for August and her new balance?

32. What would be the finance charge and new balance if the company used the adjusted balance method of computing finance charges?

33. Josie Lamas earns an annual wage of $63,470. Josie estimates her benefits at 32% of her wages. She also estimates that her job expenses are insurance, 6% of wages; commuting, $438; dues, $175; other, $225. Find her annual net job benefits.

34. What are the gross earnings of an employee who works 43 hours and is paid $11.23 an hour?

35. Xavier Morrero paid for a cable connection to StarNet, an ISP. The ISP charged a $15 installation fee, $65 for a network connection card for his computer, a monthly rental fee of $4 for a modem, and a monthly online access fee of $49.95 for an unlimited connection. Xavier also bought antivirus software for $29.99. What will be Xavier's total cost to connect to the Internet for the first year?

Last week, Greg Derkaz worked 4 hours a day Monday through Friday at his after-school job. He is paid $8.20 an hour.

36. How may hours did Greg work last week?

37. What was his gross pay for the week?

Chapter Review

Vocabulary Review

Find the term, from the list at the right, that completes each sentence. Use each term only once.

1. The money paid to purchase an insurance policy is called the ___?___.
2. A contract that allows you to use property, such as a car, for a certain period is known as a(n) ___?___.
3. A type of car insurance that covers your liability for injury to other persons is called ___?___.
4. The money paid in addition to a down payment to complete the purchase of a home is ___?___.
5. The gradual reduction in the value of a home due to aging and use is referred to as ___?___.
6. A home's estimated worth used for tax purposes is called ___?___.
7. The insurance usually obtained by tenants to cover the things they own and to provide personal liability protection is known as a(n) ___?___.
8. The protection you get from car insurance that covers possible damage to your car is known as ___?___.
9. An amount of money kept by a landlord to cover any damage you may cause when renting property is called the ___?___.
10. The money you pay to a government unit based on the value of the property you own is called ___?___.

assessed value
bodily injury
closing costs
collision
comprehensive damage
depreciation
down payment
homeowners insurance
lease
manufacturer's suggested retail price (MSRP)
negotiation
mortgage loan
premium
principal
property damage
property taxes
renters policy
resale value
security deposit
trade-in value

6-1 Borrowing to Buy a Home

11. Chester Thornton plans to buy a home for $105,700 with a 15% down payment. He estimates his closing costs as inspections, $360; property survey, $250; legal fees, $1,300; title insurance, $220; loan administration fee, $115; and recording fee, $180. What amount will Chester have to borrow to buy the home? What amount of cash will he need?
12. LuAnne Wiggins is buying a home for $167,000. She will make a 10% down payment and borrow the balance for 30 years at 8.23%. Her monthly mortgage payments will be $1,127.04. What total amount of interest will she pay over 30 years?
13. Robbie Whitaker's monthly mortgage payment is $823. His new monthly payment will be $694 if he refinances the mortgage loan. The refinancing costs are closing costs of $1,074 and a prepayment penalty of $421. How much will Robbie save in the first year by refinancing his mortgage?

6-2 Renting or Owning a Home

14. Muriel Voegel plans to buy a home. She estimates her annual home ownership expenses to be: mortgage interest, $4,873; property taxes, $2,156; home insurance, $418; depreciation, $1,800; utilities, $1,835; and maintenance and repairs, $825. She will lose $1,410 interest on her down payment and save $640 in income taxes. What will be Muriel's net cost of owning the home in the first year?

15. Rafael Gonzalez rents a home for $1,400 a month. The security deposit he paid is two months' rent. Renters insurance costs $210 a year. Rafael expects utilities to average $136 a month. What will be the cost of renting the home for the first year?

16. Heather Rayburn estimates that she would pay $4,150 a year for taxes, insurance, and maintenance on a home she bought. Other annual home costs would be $8,800 in mortgage loan interest and $1,300 in estimated depreciation. During the year, Heather would lose $820 interest on her down payment, but her income taxes would be $1,145 less. Heather could have rented the home for $1,300 a month and had annual expenses of $205 for insurance and $1,780 for utilities. Her security deposit would have been $1,200. For the first year, would it have been less expensive to buy or rent the house, and how much less?

6-3 Property Taxes

17. The Wabeek County Library System's total budgeted expense for a year is $8,240,000. Of that total, $1,970,000 will come from various sources. The rest must be raised by a property tax. The total assessed value of all property in the county is $8,500,000,000. What tax rate is needed to cover budgeted expenses, to the nearest hundred thousandth?

18. What property tax is due on a home assessed at $210,000 if the tax rate is $4.23 per $100?

19. The property tax rate is $34.67 per $1,000. Find the tax due on a business whose property is assessed at $540,000.

20. The property tax rate to maintain a park is 0.18 mills per $1 of assessed value. What tax will be paid on a home assessed at $42,500?

21. A vacant lot is assessed at $26,000. What property tax must be paid on the lot if the tax rate is 2.8 cents per $1?

6-4 Property Insurance

22. Virgil Tulley insured his home for $123,000 at an annual rate of $0.76 per $100. What premium did he pay?

23. Cecilia Emeg's apartment is located 6 miles from a fire station. She insured the apartment's contents for $15,000 and paid $49 extra for insuring a diamond ring. Use the renter's premium table to find the total insurance premium paid.

24. Jeremy O'Brien's homeowners policy has a face value of $56,400 and a $750 deductible. How much will the insurance company pay on a $1,612 loss?

25. A warehouse with a value of $240,000 is insured for $144,000 under an 80% coinsurance policy. A fire loss of $84,000 occurs. How much of the loss will the insurance company pay?

6-5 Buying a Car

26. Find the MSRP of a MR35 sports sedan, Model CTM with these options: power seats and windows, ski rack, and 36/45,000 warranty.

27. Libby Coulson agreed to a purchase price of $32,568 for a new SUV. She made a down payment of $7,500. Libby is charged 4% sales tax on the purchase price and paid $183 in registration costs. She also received a $1,500 manufacturer's rebate. Find the delivered price and the balance due on this purchase.

28. The purchase price of a used car Wade Hatcher bought was $6,140. Sales tax of 6.5% was charged on the purchase. Registration fees were $116. Wade paid cash for the car. What was the delivered price and balance due on this purchase?

6-6 Car Purchases and Leases

29. Archie Beane bought a used van for $8,127. He paid for the van with a $1,500 down payment and 24 monthly payments of $327.86. What total amount did he pay for the van and what was the finance charge on the loan?

30. Pattie Truitt made a $2,000 down payment on a 60-month SUV lease contract. Her monthly payments were $485.30. At the end of the lease she was charged $0.19 per mile for 1,800 excess miles. What was Pattie's total cost of leasing?

31. A car that costs $25,007 can be leased for $414 monthly over 4 years with a $2,100 down payment. The car's residual value is estimated to be $11,050. If the car is purchased with $2,100 down, the monthly payments will be $594 for 4 years. Which is less expensive, leasing or buying, and how much less?

6-7 Depreciating a Car

32. A new car bought for $28,240 is estimated to have a value of $6,100 after 6 years. What is the car's estimated average annual depreciation?

33. A used car bought for $16,230 was sold for $1,200 after 9 years of use. What was the car's rate of depreciation, to the nearest tenth percent?

34. A sports car bought for $24,995 was worth for $15,500 after 5 years of use. What was the car's rate of depreciation, to the nearest tenth percent?

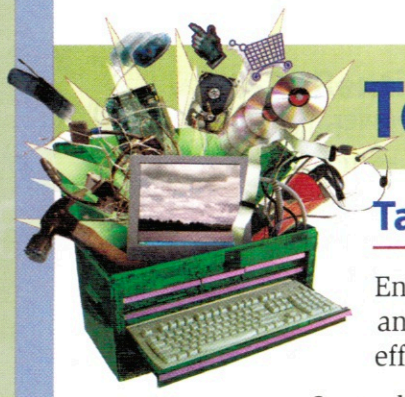
35. A new car bought for $19,465 is estimated to have a value of $8,750 after 4 years. What is the car's estimated average annual depreciation?

6-8 Cost of Owning a Car

36. Kendra Busby drives her car to work. She wants to insure the car with $100 deductibles for collision and comprehensive coverage. Kendra also wants to carry $100/$300,000 bodily injury and $100,000 property damage coverage. Use the premiums table to find the premium she must pay.

37. Bernie Kuykendall bought a used car for $7,300. His expenses for the first year were: gas and oil, $1,184; insurance, $620; repairs, $217; lost interest, $296; license plates, $56; and depreciation, 11%. What was Bernie's annual cost of operating the car?

38. James Craig drives his car for business. The company's insurance carries $50/100,000 bodily injury and $100,000 property damage. The deductibles are $500 for collision and $100 for comprehensive. Use the premiums table to find the premium the company pays to insure James' car.



Technology Workshop

Task 1 Calculating Mortgage Payments

Enter data into a template that calculates the monthly mortgage loan payments and the total interest paid on the loan. You may use the template to compare the effects of changes in the interest rate and loan term on the total interest paid.

Open the spreadsheet for Chapter 6 (tech6-1.xls) and enter the data shown in blue (cells B3-5) into the spreadsheet. The spreadsheet will calculate the monthly loan payment, total amount paid on the loan, and the total interest paid on the loan.

Your computer screen should look like the one shown below when you are done.

	A	B
1	**MORTGAGE LOAN CALCULATOR**	
2	**Mortgage Loan Data**	
3	Amount	$110,000.00
4	Interest Rate (%)	8.160
5	Term (in years)	30
6	**Mortgage Payment Data**	
7	Mortgage Factor	0.9128142
8	Number of Payments	360
9	Monthly Payment	$819.44
10	Total Amount Paid	$294,998.40
11	Less Original Mortgage	$110,000.00
12	Total Interest Paid	$184,998.40

Task 2 Analyze the Spreadsheet Output

Answer these questions about the mortgage loan calculations.

1. For how many years was the loan made?
2. What amount was borrowed?
3. What was the monthly payment?
4. What total amount was paid on the mortgage loan?
5. What total amount of interest was paid on the loan?

Now move the cursor to cell B4, which holds the mortgage interest rate. Enter the rate 8.66%, which is $\frac{1}{2}$% higher than the rate you first entered. Enter the new rate of 8.66% without the percent symbol.

Answer these questions.

6. What total interest would be paid on the loan at the higher interest rate?
7. Approximately how much more would be paid in interest over 30 years at the $\frac{1}{2}$% higher interest rate?

8. Assume you changed the loan term to 25 years and kept the rate at 8.66%. Over which term, 25 years or 30 years, do you think you would pay the greatest total amount of interest? Now, change the term to 25 years and check your thinking.

Task 3 Design an Insurance Loss Payment Spreadsheet

You are to design a spreadsheet that will calculate the amount of loss paid by an insurance company under a coinsurance policy. Also calculate the required amount of coinsurance.

The spreadsheet should have two sections, one for input data, and another for calculated data. Design your spreadsheet so the amount of loss paid is never greater than the insurance carried on the property.

SITUATION: Dewayne Clayton owns a home worth $50,000. He insures it for $35,000 under an 80% coinsurance policy. His roof was damaged by high winds, and its repair will cost $2,000. Find the amount of this loss that will be paid by the insurance company.

Task 4 Analyze the Spreadsheet Output

Answer these questions about your completed spreadsheet:

9. What amount of loss did the insurance company pay?
10. What coinsurance amount should have been carried on the home?
11. How much of the loss will Dewayne have to pay?
12. If the policy had a deductible, what change would you have to make in your spreadsheet?

Photodisc/Getty Images

Chapter Assessment

Chapter Test

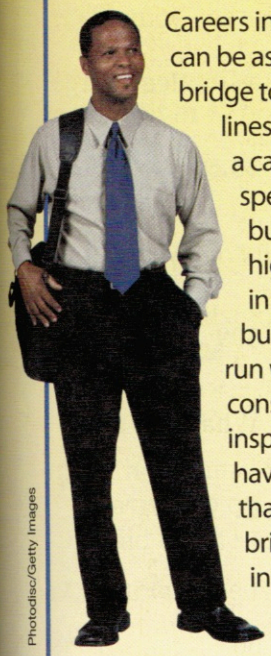
Answer each question.

1. $\$1{,}057 + \$186.20 + \$595.86$
2. $\$248{,}112 - \$162{,}905.70$
3. $360 \times \$918.47$
4. $2.45\% \times \$137{,}000$
5. $1\frac{3}{5} \times \$24{,}000$
6. $\$6{,}840 \div 0.5\%$
7. 18 is what percent of 360?
8. \$542 increased by $\frac{1}{4}$ of itself is?
9. $6\frac{1}{2} + 1\frac{3}{5} + 4\frac{3}{4}$

Solve.

10. The home that Hilda Vaughan wants to buy sells for \$213,000. She plans to make a 5% down payment and borrow the balance at 7.67% for 25 years. Her monthly mortgage payments will be \$1,517.80. What total interest will Hilda pay over 25 years?
11. Eldon Hudspeth estimates that the cost of taxes, insurance, and maintenance on a home he bought is \$4,980 a year. His other yearly costs would be \$12,760 in mortgage loan interest and \$2,050 in estimated depreciation. For a year, he would lose \$1,030 interest on his down payment and save \$2,400 on his income taxes. Eldon could have rented a similar home for \$1,400 a month and had annual expenses of \$302 for insurance and \$2,760 for utilities. The security deposit on the rented home would have been \$500. For the first year, which would have been less expensive, buying or renting a home? How much less?
12. Find the property tax due on a building assessed at \$360,000 if the tax rate is \$37.40 per \$1,000.
13. Wanda Frey insured her home for \$156,400. Her annual insurance rate is \$0.83 per \$100. What annual premium did she pay?
14. Kerry Molloy's homeowners policy has a face value of \$78,200 and a \$250 deductible. How much of a \$4,783 loss will the insurance company pay?
15. Janese Mosby bought a new car for \$27,437. She made a down payment of \$4,200. Janese must pay 5% sales tax on the purchase and \$121 in registration costs. She received a \$500 rebate from the manufacturer when she bought the car. Find the delivered price and the balance due on this car purchase.
16. A car bought for \$18,216 was sold for \$12,870 after 2 years of use. What was the car's rate of depreciation, to the nearest tenth percent?
17. Edward Laffin uses his car for pleasure driving. The insurance coverages he wants and their costs are: collision, \$368.12; comprehensive, \$146.89; bodily injury, \$164.14; property damage, \$186.34. Edward receives a 5% discount on the total premium because he drives the car less than 7,500 miles a year. What annual premium will Edward pay?
18. A car costing \$34,000 can be leased for \$473 monthly over 5 years with a \$2,420 down payment. The car's residual value is estimated to be \$16,400. If the car is purchased with a \$5,000 down payment, the monthly loan payments will be \$623 for 60 months. Is buying or leasing less expensive, and how much less?

Planning a Career in Architecture and Construction



Photodisc/Getty Images

Careers in architecture and construction can be as varied as an engineer building a bridge to a surveyor verifying boundary lines in a home sale. If you choose a career in architecture you can specialize in designs for homes, buildings, ships, planes, bridges, highways, or landscaping. A job in construction can mean you build skyscrapers, install plumbing, run wires for electricity, manage construction projects or crews, or inspect buildings or structures. If you have the ability to envision an idea that does not yet exist, or the skills to bring that idea into existence, a career in architecture and construction may be a good avenue for you.

Job Titles

- Civil engineer
- Brick layer
- Drafter
- Architect
- Aerospace engineer
- Landscape architect
- Electrician
- Boilermaker mechanic

Needed Skills

- strong organizational and leadership skills
- an exceptional eye for detail
- mathematical and scientific skills
- excellent problem-solving skills
- technical and computer skills
- the disciple to work independently, as well as in a team

What's it like to work in Architecture?

Architects specialize in designs of structures of either interiors or exteriors. Landscape architects design outdoor areas around houses, shopping centers, roadways, schools, and buildings. Landscape architects can work with engineers, scientists, and surveyors to plan the locations for buildings, roads, and walkways. These plans include sketches, reports, cost estimates, material lists, and the use of specialized software programs. Many landscape architects have their own businesses. Forty-nine states require landscape architects to be licensed. This is achieved by examination.

What About You?

What aspect of architecture and construction appeals to you? How might you best prepare for a career in this field?

How Times Have Changed

For Questions 1–2, refer to the timeline on page 207 as needed.

1. It is common for a homebuyer to pay a down payment of 10%, 15% or 20%. If a home in Baltimore, Maryland cost 315,000 in 2007, what is the range of money a buyer would likely pay as a down payment?

2. The number of households consists of the number of homeowners and the number of renters. The number of households in 2007 was about 111 million. About how many households owned homes in 2007? About how many 2007 households were renters?

Chapters 5–6 Cumulative Review

MULTIPLE CHOICE

Select the best choice for each question.

1. What is the finance charge per $100 on a loan of $5,300 with a finance charge of $954?

   A. $0.18 **B.** $1.80 **C.** $5.50
   D. $18 **E.** $555

2. What is the interest due at maturity for a $900 note borrowed for 1.5 years at a rate of 16.5%?

   A. $222.75 **B.** $148.50 **C.** $99
   D. $22.75 **E.** $14.85

3. You paid $55 interest on a 6-month promissory note of $1,000. What rate of interest, to the nearest percent, did you pay?

   A. 5.5% **B.** 5.8% **C.** 9.1%
   D. 11% **E.** 12.2%

4. How many days are between March 2 and May 9?

   A. 64 **B.** 65 **C.** 66
   D. 67 **E.** 68

5. You are thinking of buying a home for $104,300 and making an 18% down payment. You estimate closing costs will be 2.5% of the home's purchase price. How much cash will you need to buy the home?

   A. $16,166.50 **B.** $2,607.50 **C.** $18,774
   D. $21,381.50 **E.** $20,800

6. A home worth $105,000 is insured for $85,000 under a 90% coinsurance policy. How much of a $28,000 loss would an insurance company pay?

   A. $20,000 **B.** $28,000 **C.** $26,444.44
   D. $25,200 **E.** $25,185.19

7. Vicky Zielinski bought a truck on these terms: purchase price, $18,240; down payment, $2,500; rebate, $1,200; sales tax, 5%; and registration fees, $117. What was the balance due?

   A. $20,579 **B.** $15,569 **C.** $13,745
   D. $17,805 **E.** $17,979

8. Charles Codwell bought a used car for $7,195. He made an $800 down payment and paid the balance in 24 payments of $318.47 a month. What was the finance charge on the loan?

   A. $448.28 **B.** $1,258.32 **C.** $1,248.28
   D. $351.72 **E.** $1,428.28

9. A car bought new for $27,118 is sold for $950 after 14 years of use. What is the average annual depreciation?

   A. $1,869.14 **B.** $67.86 **C.** $1,937
   D. $2,854.52 **E.** $1,689.14

OPEN ENDED

10. Larry Pons has a 3-year, $10,000 installment loan at 8%. His monthly payment is $313.36. After making 22 payments, his balance is $4,175.32. If Larry decides to pay off the loan with his next payment, how much should he pay?

11. Yoko Soga borrowed $450 on a loan with a finance charge of $94.50. Find the finance charge per $100 of the amount financed.

Nathan Bogart borrows $1,540 on a simple interest installment loan at $11\frac{1}{2}\%$ agreeing to repay it in 12 equal monthly payments of $136.47.

12. What was the total finance charge on the loan?

13. What was the interest paid for the first month?

14. What was the amount applied to principal at the end of the first month?

15. The basic annual cost of an auto insurance policy on Kara Malgren's car is $726. She gets a 2% discount for having a theft alarm and side impact air bags. She also gets a 4% discount for her safe driving record. What annual premium will Kara pay?

16. A home may be bought for $72,000 with a 15% down payment. The monthly payments on a 20-year loan at 7.61% will be $497.15. What total interest will be paid on the loan?

17. A town needs $580,000 to maintain its parks. Park use fees raise $124,000 of that amount. The total assessed value of property in the town is $10,900,000. What tax rate is needed to provide enough money to maintain the parks? Round to four decimal places.

18. A home's assessed value is $185,410. If the property tax rate is $29.18 per $1,000 of assessed value, what tax is due on the home?

19. A tax rate of 24 mills per $1 of assessed value is equivalent to what rate in dollars?

20. Bess Ambrose owns a car with an average monthly cost of gas, oil, and repairs of $184. The annual costs include insurance, $842; depreciation, $1,080; license plates, $68; and lost interest, $48. What is the total annual cost of operating the car?

21. Yong's Flower Shop purchased a delivery van for $32,599. The salesperson guaranteed that the dealership would buy back the van after four years for $12,550. What is the expected rate of depreciation?

CONSTRUCTED RESPONSE

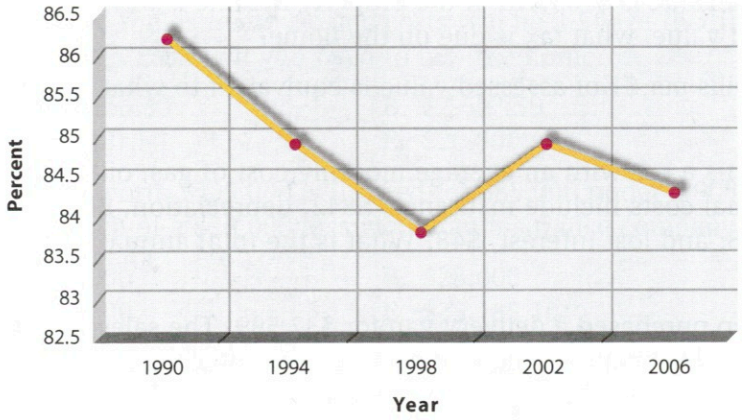
22. A car can be leased for $289 a month for 36 months with no money down. The same car could be bought for $15,680 with $1,700 down and 36 monthly payments of $453. Write a note to a friend explaining why even with the $164 monthly payment difference, leasing the car may be more expensive than buying.

Chapter 7

Insurance and Investments

Statistical Insights

Health Insurance Coverage in the United States



Source: Census Report

Workers who are not offered health insurance benefits through their place of employment sometimes purchase private health insurance, but most often do without health insurance. Use the line graph to answer Questions 1–4.

1. What does the point in the line graph over the year 2002 mean?
2. In what year shown in the graph did the greatest percentage of Americans have health insurance? About what percent?
3. In what year shown in the graph did the least percentage of Americans have health insurance?
4. **Explain** what the slope or trend of the line graph shows.

How Times Have Changed

The origin of the New York Stock Exchange can be traced to 1792. Since 1896, the Dow Jones Industrial Average (the Dow) has been used to indicate the trend of the NYSE. At its inception in 1896, the Dow was 40.74 points. About 100 years later on July 19, 2007, the Dow reached a record high of 14,000.41 points.

1896 The *Wall Street Journal* begins publishing the Dow.

1900

1906 The Dow reaches 100 points.

1920

1924 Massachusetts Investors Trust becomes the first mutual fund.

1929 The Dow reaches 381.77. Then, as a result of the stock market crash, the Dow plummeted to a low of 198.69.

1940

1960

1965 The stock market rises above its 1929 level.

1972 The Dow reaches 1,000 points.

1980

1994 Stock is traded over the Internet for the first time.

Research the two milestones the Dow reached in 1995.

1990

1999 The Dow reaches 10,000 points.

2007 The Dow reaches 14,000 points.

2000

2008 The greatest points lost in one day, 777.68, in the history of the Dow.

NET Bookmark

People whose jobs involve working with stocks watch the stock market hourly, while people that have invested in stocks check on their investments less frequently. Access **www.cengage.com/school/business/businessmath** and click on the link for Chapter 7. How do individual investors keep track of the performance of their stocks? How easy is it to buy and sell stocks online?

7-1

Life Insurance

GOALS

- Calculate life insurance premiums
- Calculate the net cost of life insurance
- Calculate the cash and loan values of a life insurance policy

KEY TERMS

- life insurance
- cash value

Start Up ▶▶▶

How important, on a scale of 1–10, is life insurance to the following people:

a. A single person with no dependents who attends school.

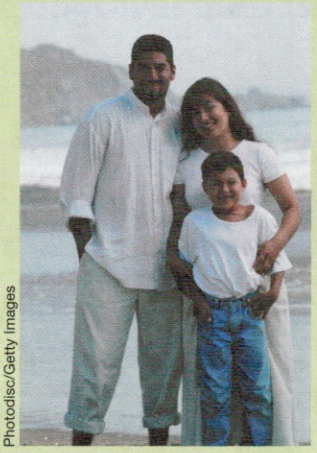
b. A single person who supports an aging parent.

c. A working couple with one child.

d. A working couple with no children.

e. A couple with two children, where one parent works and the other takes care of the children.

f. A widow with two self-supporting, adult children.



Photodisc/Getty Images

Math Skill Builder

Review these math skills and solve the exercises that follow.

1 **Divide** by 1,000.
Find the quotient. $\$250{,}000 \div 1{,}000 = \$250$

1a. $\$125{,}000 \div 1{,}000$

1b. $\$335{,}000 \div 1{,}000$

1c. $\$1{,}678{,}200 \div 1{,}000$

1d. $\$89{,}000 \div 1{,}000$

2 **Multiply** by percents.
Find the product. $\$225 \times 30\% = \$225 \times 0.30 = \$67.50$

2a. $\$189 \times 10\%$

2b. $\$210 \times 15\%$

2c. $\$549 \times 25\%$

2d. $\$92 \times 5\%$

3 **Divide** to find percents.
Find the percent. \$350 is what percent more than \$300?
$\$350 - \$300 = \$50$; $\$50 \div \$300 = 16\frac{2}{3}\%$

3a. \$300 is what percent more than \$250?

3b. \$280 is what percent more than \$240?

Life Insurance Premiums

Life insurance is a way of protecting your family from financial hardship when you die. If your income supports your family, they will need to replace that income when you die. If you are a homemaker, your surviving spouse may need to pay someone to care for your children and home. In both cases, money is needed to pay funeral costs. Life insurance may also be bought to repay debts when you die, such as a home mortgage or a car loan.

A life insurance *policy* is a contract between the *insured*, the person whose life is covered, and the insurer, the insurance company. The contract states the amount of insurance to be paid upon the death of the insured, or the *death benefits* of the policy. The death benefits are usually equal to the face amount (or *face value)* of the policy.

The money paid to an insurance company for life insurance is the *premium*. When the insured dies, death benefits are paid to the beneficiary. The *beneficiary* is the person named in the policy to receive the death benefits.

There are two basic types of life insurance policies: term life insurance and permanent life insurance. Insurance companies have designed many variations of these two types for people with different needs and budgets.

Business *Tip*

If your reason for buying life insurance is to protect your family from the loss of your income, one way to estimate how much insurance you need is to estimate how much you would have received in take-home pay from the time of your death until a retirement age of 65 or 70.

Term life insurance offers protection for a fixed period of time, such as 1, 5, or 10 years. If you die within that time, your beneficiary receives the face value of the policy. Term insurance can usually be renewed after the fixed term expires, but usually the policy premiums will be higher because you are older and more likely to die. Term insurance is the least expensive kind of life insurance.

One variation of term life insurance is *decreasing term life insurance.* With decreasing term life insurance, the face amount of the policy decreases over time. Decreasing term life insurance is popular with homeowners who use the policies to cover their mortgage loans. Because the amount of insurance declines over time, the premiums are lower than with standard term life insurance.

Whole life insurance insures you for your whole life. Premiums usually are paid from the time you take out the policy until the time of your death.

A variation of whole life insurance is universal life insurance. *Universal life insurance* allows you limited ability to change the amount of the death benefit and how much you pay in premiums. A certain amount of each premium payment is invested and earns tax-free income. In years when you can, you may pay more than the premium. The overpayment is invested. In years when your money is tight, you can pay less than the premium or skip it entirely. The premium is then paid from the invested funds.

Annual Premiums per $1,000 of Life Insurance

Age of Insured	10-Year Term		Whole Life	
	Male	Female	Male	Female
20	1.12	1.08	9.84	8.92
25	1.14	1.10	11.61	10.56
30	1.17	1.13	14.08	12.81
35	1.30	1.26	17.44	15.86
40	1.54	1.49	22.60	20.55
45	1.97	1.91	27.75	25.24

The table at the bottom of the previous page shows the premiums an insurance company might charge for each $1,000 of life insurance. Different rates are given for men and women at different ages. The rates shown are for nonsmokers. To find the annual premium for a policy, divide the face amount by $1,000 and then multiply the result by the cost per $1,000 in the table.

$$\text{Premium} = \frac{\text{Face amount of Policy}}{\$1{,}000} \times \text{Cost per } \$1{,}000$$

Business *Tip*

Most insurance companies have web sites that let you get rate quotes for different types of life insurance policies.

EXAMPLE 1

Shelly Burnam buys a $25,000 whole life insurance policy at age 25. Shelly does not smoke. What is her annual premium?

SOLUTION

Find the cost per unit in the table.

25-year old, female, whole life: 10.56

Use the formula to find the premium.

$$\text{Premium} = \frac{\$25{,}000}{\$1{,}000} \times 10.56 = \$264$$

✔ CHECK YOUR UNDERSTANDING

A. Bob Walzcek bought a $135,000 term life insurance policy. He is 35 years old and does not smoke. Find his annual premium.

B. Risa Belvador bought a $150,000 whole life insurance policy at age 20. Risa does not smoke. Find her annual premium.

Net Cost of Insurance

Some insurance companies may return part of your premium to you as a *dividend.* You may deduct the dividend from the premium due or leave the dividend with the company to buy more insurance or to earn interest. The total premium for the year less the dividend is the net cost of the insurance for the year.

Net Cost of Insurance = Total Premiums − Dividends

EXAMPLE 2

Tom Fisher paid $57 quarterly for a life insurance policy. His policy also paid a dividend of $14.80 at the end of the year. What was the net cost of his insurance policy for the year?

SOLUTION

Multiply the quarterly premium by 4.

$\$57 \times 4 = \$228$ total premium for a year

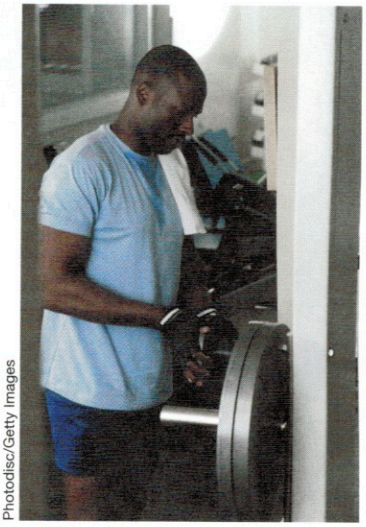
Subtract the dividend from the total premiums to find the net cost of insurance for the year.

Net Cost of Insurance $= \$228 - \$14.80 = \$213.20$

✔ CHECK YOUR UNDERSTANDING

C. Ricardo Ballas received a premium notice from his insurance company for his life insurance policy. The policy listed an annual premium of $856 and also a dividend of $38.56. Ricardo decided to deduct the dividend from the premium and pay the difference. What was the net premium he paid?

D. Yolanda Pagan doesn't smoke. Five years ago, when she was 30, she bought a whole life insurance policy for $150,000. This year her policy paid a dividend of $23.16. Using the insurance premium table, find her annual premium and the net cost of her policy for this year.



Photodisc/Getty Images

Life Insurance Cash Values

If you cancel a term policy, you get nothing. Whole life policies build cash value after premiums have been paid for a few years. **Cash value** is the money that you get if you cancel the policy. The policy may give you a choice of taking the cash, or using it to buy a small amount of whole life insurance that is totally paid up, or to buy term insurance.

The policy may also allow you to borrow up to the total amount of the cash value, often at a lower interest rate than that offered by other lenders. If you don't pay back the loan, it will be subtracted from the amount paid to your beneficiaries when you die.

A whole life policy that builds cash value would have a table much like the one shown at the right. The cash values of universal life insurance policies will vary with the current value of the investments that have been made.

Cash Value Table	
Year	**Cash/Loan Values per $1,000**
1	0
5	10
10	42
15	80
20	124
25	174

EXAMPLE 3

Using the cash value table, find the maximum amount you can borrow against your $100,000 policy if you had the policy for 20 years.

SOLUTION

Divide the face value of the policy by $1,000.

$\$100{,}000 \div \$1{,}000 = 100$ number of $1,000 units in the policy

Multiply the number of units by the appropriate table amount.

$100 \times \$124 = \$12{,}400$ maximum loan amount of policy

✔ CHECK YOUR UNDERSTANDING

E. Using the cash value table, how much can you borrow against a 10-year policy with a face value of $300,000?

F. Using the cash value table, how much would you receive if you cancelled a 15-year policy with a face value of $150,000?

Wrap Up ▶ ▶ ▶

When you rated the importance of insurance, did you consider the (a) number of dependents, (b) need for insurance to cover a mortgage, (c) need for insurance to protect against the loss of income for both working partners, and (d) need for money to cover the cost of burial?

Communication

Investigate the interest rates charged for a car loan from one credit union and one bank. Then find the interest rate charged for borrowing from a whole life insurance policy's cash surrender value. Prepare a chart of your results and present your findings to the class.

Some sources for gathering information include:

- Internet
- a credit union
- a bank
- an insurance agent

Exercises

Find the quotient or product.

1. $\$104{,}580 \div 1{,}000$
2. $\$59{,}320 \div 1{,}000$
3. $\$28 \times 25\%$
4. $412 \times \$0.76$
5. $\$339 \times 20\%$
6. $78 \times \$1.54$

Divide to find the percent.

7. \$500 is what percent more than \$400?
8. \$750 is what percent more than \$500?

Use the insurance premium table to solve Exercises 9–14.

	Policy Type	Age and Sex	Policy Face	Annual Premium
9.	Whole Life	20, female	\$200,000	
10.	10-Year Term	30, male	\$150,000	
11.	10-Year Term	40, female	\$400,000	
12.	Whole Life	25, male	\$50,000	

13. How much more is the annual premium on a \$50,000, whole life policy for a male at age 45 than at age 25?
14. How much more is the annual premium on a \$100,000, whole life policy than a 10-year term policy for a 30-year old female?

Solve.

15. Paul Poncelli, age 30, is comparing the premium for a $100,000, whole life policy he may take now and the premium for the same policy taken out at age 35. Find the difference in total premium costs over 20 years for this policy at the two age levels.

16. Melva Davis paid an annual premium of $12.80 per $1,000 for an $8,000 life insurance policy. Her policy also paid a dividend of $18.90, which she used to reduce her premium. What net premium did Melva pay?

17. Trent Coleman pays a premium of $18.80 per $1,000 for a $120,000 life insurance policy. During the year, his policy paid a dividend of $11.90. What is the net cost of the policy for the year?

18. Alicia Ronzetti bought a 30-year decreasing term life insurance policy to repay her 30-year, $150,000 mortgage in the event of her death. The insurance company's annual rate per $1,000 for the policy was $0.76. What was her annual premium?

19. Silvia Olivares takes out a universal life policy for $50,000 and pays $490 in annual premiums. What total amount will she pay in premiums in 20 years?

20. **STRETCHING YOUR SKILLS** Because she smokes, Valerie Corini pays 20% more for life insurance. How much more will Valerie pay for $150,000 of 10-year term insurance at age 45 than a nonsmoker would pay at the same age?

21. **STRETCHING YOUR SKILLS** To the nearest percent, what percent greater is the cost of a whole life policy taken out by a male at age 45 than at age 35?

STRETCHING YOUR SKILLS Rollie Collins, age 25, wants to pay no more than $600 a year in life insurance. In even thousands of dollars, what is the largest policy he can buy without spending more than $600 annually on a

22. whole-life policy?

23. 10-year term insurance policy?

Use the table of cash values to solve Exercises 24–28.

24. How much cash would you get if you canceled a $50,000 whole life policy after paying premiums for ten years?

25. You have paid annual premiums of $242 on a $75,000 policy for ten years. What amount could you borrow on your policy?

26. What amount could you borrow on a $200,000 policy that was 25 years old?

27. How much could you borrow on a 15-year-old policy with a face value of $50,000?

28. What amount would you receive if you canceled a $150,000 policy that you had held for 20 years?

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29. **STRETCHING YOUR SKILLS** Bill Woolsley paid annual premiums on a $50,000 whole life policy at a rate of $17.20 per $1,000. After ten years, he canceled the policy and found that its cash value was $49 per $1,000. Over the ten years, he received dividends of $318.55. For the time Bill had the policy, find the net cost of the insurance he held.

30. **CRITICAL THINKING** Four different types of life insurance were discussed in this lesson. Return to the list of insurance situations presented at the start of this lesson. Which type of life insurance, if any, would you recommend in each situation and why?

31. **FINANCIAL DECISION MAKING** What concerns should a person have for borrowing money from the cash surrender value of their insurance policies?

Mixed Review

32. Write $128\frac{3}{5}\%$ as a decimal.

33. Find $12\frac{1}{2}\%$ of $184.

34. Multiply $217.80 by 22%, to the nearest hundredth.

35. $30.20 increased by 30% of itself is?

36. The average of 14, 28, 19, 22, and 18 is?

37. $\frac{2}{5} \div \frac{1}{8}$

38. Charlie Evers is paid $12.56 an hour and time-and-a-half for overtime. Last week he worked 40 regular and 4.5 overtime hours. What was his gross pay for the week?

39. Sonia Ortiz earned $1,500 last year at her part-time job. Her parents claimed her as a dependent on their federal income tax return. What taxable income did Sonia have last year?

40. Rosie McFarland's check register balance on October 31 was $374.60. In making a reconciliation statement, she found that a check for $17 was incorrectly recorded in the register as $71; she had no record in her register of a service charge of $2.80, earned interest of $0.71, and a deposit of $68.74. What was her correct check register balance?

41. Umeki Akita repaid a loan of $3,200 in 15 monthly installments of $232.80 each. Use the annual percentage rate table in Chapter 5 to find the APR on his loan.

42. The regional library system tax rate in Odell County is 2.5 mills per dollar of assessed value. Find the tax to be paid on property assessed at $87,000.

Vi Foe is 25 and doesn't smoke. She owns a $200,000 whole life insurance policy.

43. Using the insurance premium table, what is her annual premium?

44. During this year, her policy paid a dividend of $62.10. What was the net cost of her policy for the year?

45. Roger canceled his $250,000 whole life policy. The cash/loan value for his policy at the time was $95 per $1,000 of insurance. How much did Roger receive when he cancelled his policy?

7-2

Health Insurance

GOALS

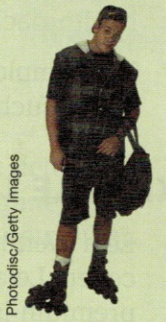
- Calculate health insurance premiums
- Calculate health insurance benefits and coinsurance

KEY TERMS

- health insurance
- major medical insurance
- coinsurance

Start Up ▶▶▶

Wilbur Bradley has just entered college as a freshman. As part of the enrollment procedures, he is offered a health plan that covers him while he is enrolled as a student. Wilbur doesn't think he should spend the money on the premiums because he is young and healthy. He asks you for advice. What would you tell him?



Photodisc/Getty Images

Math Skill Builder

Review these math skills and solve the exercises that follow.

1. **Add** dollar amounts.
   Find the sum. $378 + $108 + $2,823 = $3,309

   1a. $4,298 + $218 + $48

   1b. $376 + $294 + $1,397

2. **Subtract** dollar amounts from dollar amounts.
   Find the difference. $3,298.28 − $1,089.27 = $2,209.01

   2a. $1,703.93 − $727.19

   2b. $7,319.29 − $3,519.07

3. **Multiply** dollar amounts by whole numbers and percents.
   Find the products. $45 × 12 = $540 and $798 × 35% = $798 × 0.35 = $279.30

   3a. $59.20 × 12

   3b. $197 × 6

   3c. $488 × 65%

   3d. $1,497 × 72%

Health Insurance Premiums

Health insurance, like other insurance, protects against financial loss. In this case, the financial loss is from medical bills. Employers often provide *group health insurance* as a job benefit for employees and their families. The employee usually pays part of the cost of the group policy. If you are not covered by a group policy, you may buy individual health insurance for yourself and your family, but it is usually more expensive.

Group health policies usually provide *basic health coverage,* including:

- *Hospitalization insurance,* which helps pay expenses of a hospital stay, such as hospital room, medicine, lab tests, X-rays, operating room.
- *Surgical insurance,* which covers the fees of doctors who do surgery or who help with surgery in or out of a hospital.
- *Medical insurance,* which pays the fees of other doctors who see you in or out of the hospital, as well as some other medical expenses, such as physical therapy.

You may supplement your basic health coverage with **major medical insurance**. It helps pay for hospital, surgical, medical, or other health care expenses due to a major illness or an injury. Often basic health insurance and major medical insurance policies are combined into one comprehensive health package.

Your employer may also have group plans for other health areas, such as dental insurance and vision insurance.

Problem Solving *Tip*

To find the employee share of the premium, deduct the employer's percentage share from 100%. The difference is the employee's percentage share. Then multiply the total premium by the employee's percentage share.

EXAMPLE 1

Lela Wendt's employer offers a health insurance plan that covers Lela, her husband, and their child. The total monthly premium is $285, of which the employer pays 26%. How much does Lela pay for the health insurance for one year?

SOLUTION

Multiply the total monthly premium by 12.

$\$285 \times 12 = \$3{,}420$ total annual premium

Multiply the total annual premium by 26%.

$\$3{,}420 \times 0.26 = \$889.20$ part of annual premium paid by employer

Subtract the employer's share of the premium from the total premium.

$\$3{,}420 - \$889.20 = \$2{,}530.80$ Lela's share of health insurance for year

✔ CHECK YOUR UNDERSTANDING

A. Ted Larkin's employer pays 50% of his annual health insurance premium. If the total monthly premium for the insurance is $57, what is Ted's share of the annual premium?

B. An employer provides dental health insurance to employees. The monthly premium cost per employee is $36. If the employees pay 65% of the premium, what is the total annual premium paid by an employee for the dental insurance?

Health Insurance Benefits and Coinsurance

Basic health insurance plans usually include an *annual deductible amount* for each insured person. When the health bills for a person covered by the plan exceed the deductible amount for that person, the insurance company begins to pay benefits.

Major medical insurance plans usually have a deductible amount for *each* treated illness or injury. For example you may be required to pay the first $500 of a health bill for an injury before the insurance company begins to pay benefits.

Once the deductible amount has been met, you usually must pay part of the remaining health bills out of your own pocket. These partial payments are called **coinsurance**, or *co-payments*. For example, you may be required to pay as coinsurance 15% of a surgery bill. Or, you may be required to pay a $25 co-payment for each visit to a doctor's office.

Usually coinsurance is stated as a percent and co-payments as a dollar amount. Whether you pay coinsurance or a co-payment, they are both your share of the bill for services rendered.

Finally, the total health bill may not be covered by your policy. For example, a psychiatrist may charge $85 for each office visit but your insurance policy may set a maximum benefit of $70 for such visits.

Business *Tip*

Indemnity plans allow you to choose your own doctors and hospitals but the coinsurance amounts are usually higher than HMOs. HMOs usually require you to use specified doctors and hospitals.

To find how much of a health bill you will have to pay, you must first determine how much of the bill is covered by your policy. Next, you must determine if you have any deductible amount left to pay for the year. Then you must know what coinsurance percent you are responsible for.

Uncovered Amount = Total Bill − Covered Amount

Coinsurance Amount = (Covered Amount − Deductible) × Coinsurance Rate

Amount Insured Must Pay = Uncovered Amount + Deductible + Coinsurance

EXAMPLE 2

Jolene Ridgeway underwent surgery for an injury. The hospital portion of the bill was $5,298, of which only $4,875 was covered by Jolene's group medical insurance policy. In addition, the coinsurance amount of the bill was 18%, and the remaining deductible she had for the year was $300. How much of the hospital bill must Jolene pay?

Photodisc/Getty Images

SOLUTION

Subtract the covered portion from the total bill.

$5,298 − $4,875 = $423 uncovered amount

Subtract the deductible from the covered amount.

$4,875 − $300 = $4,575

Then multiply by the coinsurance rate.

$4,575 × 0.18 = $823.50 coinsurance amount

Add the uncovered amount, the deductible amount, and the coinsurance amount.

$423 + $300 + $823.50 = $1,546.50 amount Jolene must pay

Business *Tip*

Group policies are issued on a group of people, such as all the employees in a firm. Group policies usually do not require the employee to take a physical examination.

✔ CHECK YOUR UNDERSTANDING

C. The surgery portion of Ruiz Alicea's total medical bill was $2,964. Only $2,583 was covered by his group medical insurance policy. Ruiz's coinsurance for the surgery was 21%, and his remaining annual deductible was $500. What amount of the surgery bill must Ruiz pay?

D. Elisa Renteria's dental insurance plan pays a maximum of $450 for a crown. It also requires her to pay 10% coinsurance. Her policy does not have a deductible. The bill she receives for a crown from her dentist is $525. How much of that bill will Elisa pay?

Wrap Up ▶ ▶ ▶

You might tell Wilbur that accidents can happen to anyone at anytime. Also, while he is less likely than older people to become seriously ill, the possibility still exists. By taking out the policy, he will be insuring against the risk of large health bills with a relatively small amount of insurance premium.

TEAM Meeting

With two other students, investigate the advantages and disadvantages of health maintenance organization health plans, or HMOs, and indemnity health plans. You should use Internet search tools and talk to at least one health insurance agent to obtain your information.

You need to define a health maintenance organization plan. Name the requirements and the general premise under which they operate. Also explain an indemnity health plan, its requirements, and how they function.

List the advantages and disadvantages of each. It is a good idea to question adults who participate in each type of program and get their opinions.

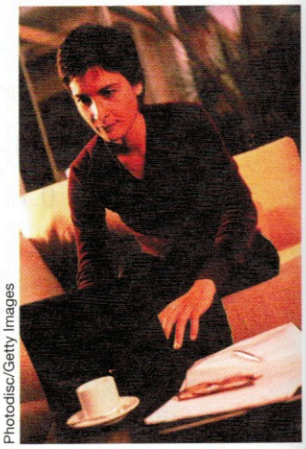
Exercises

1. $298 + $12,216 + $4,228

2. $9,039 − $457.89

3. $3,158 × 12%

4. Bella Melino elects to be covered by her employer's vision health insurance program. The program covers part of the expense of eye examinations, eye glasses or contact lenses, and office visits. The total monthly premium is $105.36, of which the employer pays 45%. Bella's share of the monthly premium is deducted from her monthly paycheck. What is the amount of the deduction?



Photodisc/Getty Images

The annual premium for Chi Kuo's health insurance plan is made up of $2,844 for hospitalization and medical; $1,649 for surgery; and $428 for major medical. Chi's employer pays 42% of the premium.

5. What is the total annual premium for Chi's health plan?

6. What is Chi's share of the total annual premium?

Rosa Suarez pays for a general health plan, a dental health plan, and a vision health plan through her employer. The monthly premiums are: general health, $209; dental health, $265; vision health, $59. Her employer's share of these plans is: general health, 35%; dental health, 45%; vision health, 75%.

7. What is the total monthly premium for all of Rosa's health plans?

8. What is her employer's share of that total monthly premium?

Stanislov Pulkin works for a county agency as an accountant. His employer provides group health policies for basic health care, major medical health care, and dental health care. The annual premium for Stanislov consists of $3,190 for basic health, $518 for major medical, and $2,875 for dental. The county picks up 57% of his basic, 60% of his major medical, and 32% of his dental health premiums.

9. What is the total annual premium for all of Stanislov's health plans?

10. What is his share of the total annual premium?

11. If the county deducts his share from his weekly paycheck, what is the amount of the deduction?

Zena Tubicek can buy a group major medical insurance plan from her employer at a monthly premium of $56 or buy an individual policy with similar coverage from another insurance company for $938 annually.

12. What is the difference in annual premiums between the employer's group policy and the individual policy?

13. By what percent, to the nearest tenth of a percent, does the individual policy premium exceed the group policy premium?

Davey's major medical policy has a $1,000 deductible feature and he must pay 10% coinsurance. He is injured in an accident and his health care bills amount to $21,700.

14. What amount will be paid by his insurance company?

15. What amount will he pay?

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Molly Nairah had three x-rays taken at a total cost of $230. Under her major medical coverage, the insurance company paid 80% of the cost of x-rays after a $25 deductible fee for each x-ray.

16. What was the company's share of the cost of the x-rays?

17. What was Molly's share of the cost?

Eve and Ollie Dunbar's major medical policy pays 90% of covered expenses for each of them in any year. A $500 deductible feature applies to each person's claim. Last year the Dunbars made two medical claims. Eve's claim was for $1,230; Ollie's claim was for $1,870. The insurance company did not cover $170 of Eve's claim and $225 of Ollie's claim. What amount did the Dunbars receive from their insurance company for

18. Eve's claim?

19. Ollie's claim?

Solve.

20. Frank Duval was hospitalized for an illness for 12 days. The cost of his hospital room was $458 a day. The cost of medical services was $2,492. His insurance company covered the full amount of the medical services but allowed only 8 days of hospitalization for his illness. The policy also requires $250 in deductible and 15% coinsurance for the remaining hospital room and medical services costs. What amount did Frank have to pay for his illness?

21. Julie Crane required lengthy hospital and medical care. The fees of her doctors were $128,700 and covered at 90% by her major medical policy. Her hospital expenses were $44,460, and the policy covered 85% of the hospital bills beyond a $500 deductible. After Julie left the hospital, a physical therapist made 15 visits to her home at $95 a visit. Julie's policy paid 70% of the therapy bills. Of the total expenses, what amount did Julie have to pay?

22. Mehta Goldberg was hospitalized for 12 days. Her total bill for medical care was $21,570. Mehta's major medical coverage pays for 85% of medical expenses above a $750 deductible. How much of the bill does Mehta owe after the insurance company pays its share?

23. **STRETCHING YOUR SKILLS** An employee's share of a vision insurance policy premium was $130. This was 65% of the policy premium. What was the policy premium?

24. **FINANCIAL DECISION MAKING** What factors should you consider as you evaluate a health insurance policy?

Mixed Review

25. Add $34.12 + $19.98 + $108.29 + $72.07 + $2,781.

26. Multiply 208.108×0.28, to the nearest hundredth.

27. Divide 642 by 46 to the nearest thousandth.

28. Subtract: $1\frac{5}{8} - 1\frac{1}{4}$

29. Subtract: $4\frac{1}{4} - 1\frac{7}{8}$

30. $13.30 is what percent greater than $10.64?

31. A truck which originally cost $16,450 is traded in eight years later for $3,290. What was the average annual depreciation on the truck?

32. After 10 years, Lisa Myers canceled her $35,000 life insurance policy and took the cash value of $57 per $1,000. The annual premiums on the policy were $370. While the policy was in effect, she received a total of $217.90 in dividends. What was the net cost of the policy?

Ben Arnold worked 48 hours last week. He earned $11.72 per hour for the first 37.5 hours. For time worked over 37.5 hours, he earned time-and-a-half. Deductions of $172.29 were made from his paycheck.

33. Find Ben's gross pay for the week.

34. Find his net pay for the week.

7-3

Disability Insurance

GOAL

- Calculate disability insurance benefits

KEY TERM

- disability insurance

Start Up ▶▶▶

Ghayda Meguid is 35 and has 2 children. She has purchased as much term life insurance as she thinks she needs. However, she has no disability insurance. She works as a systems programmer for a software company and doesn't believe she is at risk for injuries. What would you advise her to do?

Maxim Bolotniktov/ Shutterstock.com

Math Skill Builder

Review these math skills and solve the exercises that follow.

1. **Divide** dollar amounts by whole numbers.
   Find the quotient. $\$280{,}000 \div 4 = \$70{,}000$

   1a. $\$105{,}000 \div 3$ **1b.** $\$325{,}000 \div 4$ **1c.** $\$1{,}286{,}700 \div 20$

2. **Multiply** dollar amounts by percents.
   Find the product. $\$25{,}000 \times 60\% = \$25{,}000 \times 0.6 = \$15{,}000$

   2a. $\$18{,}290 \times 30\%$ **2b.** $\$21{,}800 \times 45\%$ **2c.** $\$54{,}790 \times 65\%$

3. **Subtract** dollar amounts.
   Find the difference. $\$1{,}560 - \$253 = \$1{,}307$

   3a. $\$2{,}250 - \$314$ **3b.** $\$1{,}230 - \$428$ **3c.** $\$1{,}548 - \$217$

Disability Insurance Benefits

Disability insurance pays you a portion of the income you lose if you cannot work due to a health condition or an injury.

One form of disability insurance is *short-term disability insurance.* This policy pays you a portion of your income for a short period of time, such as 13–26 weeks. Usually there is a maximum amount that can be paid out per week or month.

Business *Tip*

The portion of your income paid by insurance is usually stated as a percentage of your income. It is called the *benefits percentage.*

Another form of disability insurance is *long-term disability insurance.* This type of policy may cover you for several years or until you reach retirement age. The longer the term of coverage, the higher the premium.

Disability insurance is usually bought through a group plan offered through your employer. You can also buy an individual plan rather than group disability insurance, but it is usually more expensive.

If your job is covered by social security, you also may be eligible for disability insurance through the federal government. Your annual social security statement shows how much monthly disability benefits you are eligible to receive.

If you are injured on the job, you may be covered by *Worker's Compensation insurance.* This insurance covers lost wages and medical expenses from on-the-job injuries. It is usually required by state governments and for work on federal contracts and paid for by the employer.

The benefits you receive from disability insurance depend on whether you are totally or partially disabled, how long you have worked, your wages, percent of your wages that are paid as benefits, and other factors. Also, the benefits you receive may be reduced by the benefits you receive from worker's compensation and social security disability insurance.

EXAMPLE 1

Phil Kustin injures himself in an accident and cannot work. His disability policy pays 60% of his average annual wages for the last 3 years. His wages were \$28,500, \$29,070, and \$29,940. What is Phil's monthly disability benefit?

SOLUTION

Add the annual wages. Divide the total by 3.

$\$28{,}500 + \$29{,}070 + \$29{,}940 = \$87{,}510$

$\$87{,}510 \div 3 = \$29{,}170$ average wages for last 3 years

Multiply the average wages by the benefit percentage.

$\$29{,}170 \times 0.6 = \$17{,}502$ annual disability benefit

Divide the annual disability benefit by 12.

$\$17{,}502 \div 12 = \$1{,}458.50$ monthly disability benefit

Business *Tip*

The Social Security web site address is www.ssa.gov.

✔ CHECK YOUR UNDERSTANDING

A. Yan Kaponovich becomes totally disabled. His group disability policy's benefit percentage is 65% of his average annual salary for the last 3 years. His annual salaries were \$45,200; \$48,300; and \$49,900. What monthly benefit amount will he receive?

B. Kelly O'Hara is injured and is covered by a group disability policy and by social security disability insurance. Her group policy pays 45% of her average wages for the last 4 years, less any other disability benefits she receives from other policies. Social security disability will pay her \$225 a month. If her wages for the last 4 years were \$34,600; \$34,900; \$40,800; and \$42,000, what is the total amount Kelly will receive a month from her group policy?

Photodisc/Getty Images

Wrap Up ▶ ▶ ▶

You might advise Ghayda that she can be injured in her home or in her car. About one third of all Americans will suffer a serious disability between the ages of 35 and 65 and 1 in 5 of all Americans will become disabled to some extent during their lives. If she becomes totally or partially disabled, her family will lose her income. She should consider buying disability insurance and she should check to see if she has coverage through worker's compensation and social security.

Communication

Life insurance policies provide income to your survivors when you die. Disability insurance policies provide income to you and your dependents if you become unable to work due to injury or illness. Use the Internet to find answers to these questions:

1. What percent of employees of U.S. companies are offered group life insurance policies and what percent are offered group disability insurance?
2. What is the chance that a person who is 21 years of age will die versus the chance that that person will become disabled?

Prepare an information flyer that might be posted in a lunch or break room at a place of employment. The flyer should include the web page addresses of your sources of information.

Exercises

Perform the indicated operation.

1. $\$569{,}400 \div 12$
2. $\$45{,}800 \div 5$
3. $\$5{,}884 - \$885$
4. $\$22{,}509 \times 10\%$
5. $\$31{,}770 \times 60\%$
6. $\$12{,}929 - \$4{,}228$
7. Fayad Mehkta is insured under a disability policy that calculates his benefits percentage at 2.25% for each year he has worked for his company. If Fayad has worked 12 years at the company, what is his benefits percentage?

Louisa Tibaldi's group disability policy has a benefit percentage of 65% of her average annual salary for the last 2 years. Her annual salary for the last 2 years was $65,200 and $68,300.

8. What is Louisa's average annual salary for the last 2 years?
9. What monthly benefit amount will she receive?

Trisha Dabney's disability insurance policy will pay her 45% of her average annual wages for the last 4 years. It will reduce the benefits paid by any amounts Trisha receives from worker's compensation insurance. Trisha's wages for the last 4 years were $24,560; $25,100; $25,820; and $26,200.

10. What was Trisha's average annual wage for the last 4 years?
11. If she receives $467 monthly from worker's compensation, what monthly income will her disability insurance company pay her?

Renaldo Rodriguez's group disability policy pays a benefit percentage of 2.5% for each year that he has worked for his company. The benefit percentage is applied to his average monthly compensation for the last 36 months. Renaldo has worked for 17 years for the company at an average monthly wage of $3,500 for the last 36 months.

12. What is his disability benefit percentage?

13. What monthly benefit amount would he receive?

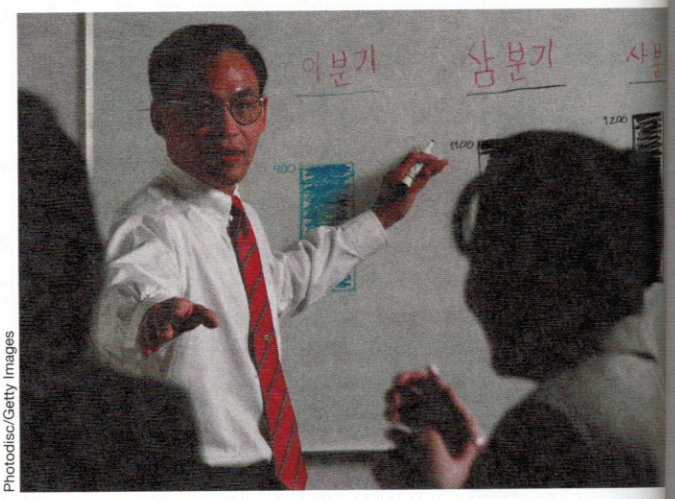
A college provides short-term disability insurance for its employees. The benefits depend on years of service at the college and the benefit percentage the employee chooses. The chart below shows the number of weeks employees would receive benefits for depending on whether they chose to receive 100%, 80%, or 60% of their weekly income.

The Number of Weeks an Employee Will Receive Benefits			
	Benefit Percentage Chosen		
Years of Service	**100% of Wages**	**80% of Wages**	**60% of Wages**
Less than 5	1	4	5
5 but less than 10	5	5	10
10 but less than 15	5	10	15
15 but less than 26	5	15	20

14. How many weeks of benefits will an employee who has worked for 7 years receive if the employee chooses a benefit percentage of 80% of his or her salary?

15. Kim Lucas has worked at the college for 12 years. How many weeks of coverage would she receive if she chose a benefit percentage of 60%?

16. Jose Fuentes worked for 21 years at the college before being injured. If Jose needs to receive benefits for 20 weeks, what benefits percentage should Jose choose?



Photodisc/Getty Images

STRETCHING YOUR SKILLS A worker receives $27,830 in monthly disability benefits based on the average of her last 3 years of salary. If her salary for the last 3 years was $49,300; $50,300; and $52,200

17. What was her average salary for the last 3 years?

18. What benefits percentage did she receive?

19. **CRITICAL THINKING** What reasons might be used to explain why disability payments are usually less than the last salary or wages of an employee?

Mixed Review

20. Write $1\frac{1}{3}$ as a percent.

21. What percent is 77.25 of 618?

22. Divide 592 by 1.06, to the nearest tenth.

23. \$60.40 is what percent less than \$78.52, to the nearest tenth percent?

24. Find the average of \$1,250, \$1,280, \$1,297, and \$1,320.

25. Divide $\frac{3}{8}$ by $\frac{2}{5}$.

26. Multiply: $5\frac{2}{3}$ by $2\frac{1}{2}$

27. Alberto Viña is paid \$13.20 an hour for the first eight hours of work each day and time-and-a-half for overtime past 8 hours. Last week Alberto worked these hours: Mon., 8; Tues., 10; Wed., 6; Thurs., 7; Fri., 10. What was Alberto's gross pay for the week?

28. Ivy Washington had a balance of \$259.12 in her checking account at the start of the day. During the day she wrote a check for \$35, withdrew \$100 using her ATM card, and deposited a rebate check for \$25 she received from a recent purchase. What is her new balance after her bank processes the items?

29. Tom Wilson received a \$2,300 trade-in for a car that he originally paid \$12,500 for six years ago. What was the average annual depreciation on the car?

30. Sean O'Leary bought a \$200,000 term insurance policy. The annual premium was \$1.07 per \$1,000 of insurance. What was Sean's annual premium for the policy?

31. Rosa Carlotto's employer pays 65% of her health insurance premium. If the total monthly premium for the insurance is \$127, what is Rosa's share?

32. Roger Tulane invested \$10,000 in a 4-year CD that paid 6% annual interest. When he cashed out the CD at the end of 3 years, he was charged an early withdrawal penalty of 6 months' interest. What was the amount of the penalty?

33. June Riebold's taxable income last year was \$45,380. She paid state income taxes of 5.5% and city income taxes of 1.3%. What was the total of her state and city income taxes for the year?

34. On July 1, Laura Knolls deposited \$540 in a bank account that paid 4% interest per year, compounded semiannually. Interest was added on January 1 and July 1. Find her balance on July 1 of the next year if she made no other deposits or withdrawals.

35. Joelle had a balance of \$274.35 in her checking account. She went to the bank with these deposits: \$125.99, \$98.45, and \$303.30. She asked for \$75 cash back. What was her total deposit? What is the balance in her account after the deposit?

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7-4

Bonds

GOALS

- Calculate the market price of bonds
- Calculate the total investment in bonds

KEY TERMS

- bond
- premium
- discount

Start Up ▶▶▶

Vanessa Olemkov earns $44,500 a year. She is considering investing all of her savings in the stock market because she has been told that the market provides the most return for your dollar over the long run. What advice might you give Vanessa?

Photodisc/Getty Images

Math Skill Builder

Review these math skills and solve the exercises that follow.

1. **Multiply** dollar amounts by whole numbers.
Find the product. $\$1{,}075 \times 4 = \$4{,}300$

1a. $\$504 \times 6$ **1b.** $\$1{,}085 \times 9$ **1c.** $\$509 \times 8$

2. **Multiply** dollar amounts by percents.
Find the product. $\$1{,}000 \times 106\% = \$1{,}000 \times 1.06 = \$1{,}060$

2a. $\$500 \times 97\%$ **2b.** $\$1{,}000 \times 95\%$

2c. $\$500 \times 101\%$ **2d.** $\$1{,}000 \times 103.2\%$

2e. $\$500 \times 6.5\%$ **2f.** $\$1{,}000 \times 7.8\%$

3. **Add** dollar amounts.
Find the sum. $\$1{,}050 + \$55 = \$1{,}105$

3a. $\$512 + \$28$ **3b.** $\$1{,}040 + \$65$ **3c.** $\$519 + \$632$

4. **Write** percents as decimals.
Write 103% as a decimal. $103\% = 1.03$

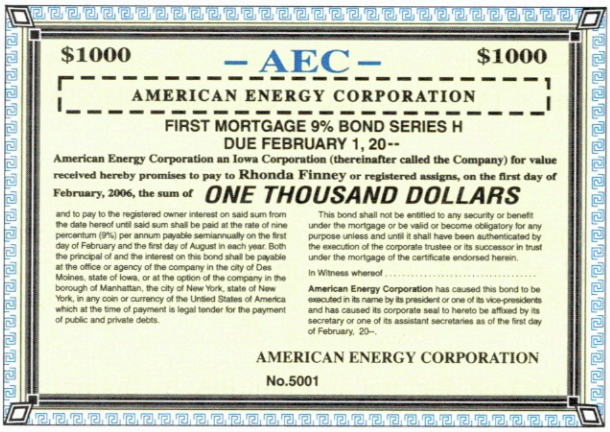
4a. 106% **4b.** 108.9%

4c. 98% **4d.** 96.4%

Market Price of Bonds

A bond is a form of long-term promissory note. **Bonds** are a written promise to repay the money loaned on the due date. *Bondholders,* or the people who own the bonds, may keep them until the due date or sell them to other investors.

Bonds are usually issued with a face, or par value of $1,000. Bonds may also be issued with other par values, such as $500, $5,000, or $10,000. Par value is the amount of money that the *issuer,* or the organization that sells the bonds, agrees to pay the bondholder on the due date.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AMERICAN ENERGY CORPORATION

FIRST MORTGAGE 9% BOND SERIES H
DUE FEBRUARY 1, 20--

American Energy Corporation an Iowa Corporation (thereinafter called the Company) for value received hereby promises to pay to Rhonda Finney or registered assigns, on the first day of February, 2006, the sum of ONE THOUSAND DOLLARS

and to pay to the registered owner interest on said sum from the date hereof until said sum shall be paid at the rate of nine percentum (9%) per annum payable semiannually on the first day of February and the first day of August in each year. Both the principal of and the interest on this bond shall be payable at the office or agency of the company in the city of Des Moines, state of Iowa, or at the option of the company in the borough of Manhattan, the city of New York, state of New York, in any coin or currency of the United States of America which at the time of payment is legal tender for the payment of public and private debts.

This bond shall not be entitled to any security or benefit under the mortgage or be valid or become obligatory for any purpose unless and until it shall have been authenticated by the execution of the corporate trustee or its successor in trust under the mortgage of the certificate endorsed herein.

In Witness whereof .....

American Energy Corporation has caused this bond to be executed in its name by its president or one of its vice-presidents and has caused its corporate seal to hereto be affixed by its secretary or one of its assistant secretaries as of the first day of February, 20--.

AMERICAN ENERGY CORPORATION

No.5001

The *market value* of a bond is its selling price and may be different from par value. If the market value is more than par value, the bond is selling at a **premium**. If the market value is less than the par value, the bond is selling at a **discount**. The amount of the premium or discount is the difference between the market value and the par value.

The market price, or market value, of a bond is quoted as a percent of the par value. For example, a price quotation of 97.056 means 97.056% of the par value. This bond is selling at a discount. To find a bond's market price, multiply its par value by the percent. If the price of a $500 par value bond is 102.182, the market price is 102.182% of $500, or $510.91. This bond is selling at a premium.

EXAMPLE 1

Edgewood School Bonds are selling at 97.223. What is the price of one of the school's $1,000 bonds? Are these bonds selling at a discount or a premium?

SOLUTION

Convert the market price to a decimal and multiply by the bond's par value.

$97.223 = 0.97223$; $0.97223 \times \$1{,}000 = \$972.23$ market price

The bond is selling at a discount because the price is less than the par value.

✔ CHECK YOUR UNDERSTANDING

A. AGL Industries $1,000 bonds are quoted at 103.883. What is the market price of the bonds? Are they selling for a discount or premium?

B. Millville Water District bonds are selling at 96.225. What is the market price of one of their $500 bonds? What is the amount of discount on each bond?

Total Investment in Bonds

Bonds are usually bought and sold through a broker, who is a dealer in stocks and bonds. *Full service* brokers provide advice on what and when to buy and sell. They charge a *broker's commission* or brokerage fee but the commission is usually included as part of the price the buyer pays for a bond and not shown separately. *Discount* and *online brokers* offer less financial help but also charge less commission. They usually show their commission rates on their web sites.

To find the total investment in bonds, you must find the market price of one bond, add the commission if it is known, and multiply by the number of bonds bought.

Total Bond Investment = (Market Price + Commission) × Number of Bonds

EXAMPLE 2

Leroy Walker bought 10, $1,000 Regis, Inc. bonds at 104.113 from a broker. The broker charges $4 per bond commission. What was Leroy's total investment?

SOLUTION

Convert the market price to a decimal and multiply by the par value.

$104.113 = 1.04113$; $\$1{,}000 \times 1.04113 = \$1{,}041.13$ market price of 1 bond

Add the commission charge to the market price.

$\$1{,}041.13 + \$4 = \$1{,}045.13$ total price of bond plus commission

Multiply the total price of 1 bond by the number of bonds bought.

$\$1{,}045.13 \times 10 = \$10{,}451.30$ total investment

✔ CHECK YOUR UNDERSTANDING

C. Clara Maliszewski bought 10, $1,000 Xnet Corporation bonds at 97.297. No commission was shown. What is the total investment Clara has in the bonds?

D. Taylor Wilson bought 15, $1,000 Maryville Sewer District bonds at 103.228. The broker charged $3 per bond commission. What total investment did Taylor make in the bonds?

Wrap Up ▶ ▶ ▶

While it is true that the stock market has been a good investment over the long run, Vanessa may need money in the short run for emergencies or job loss. Placing all her savings in the stock market may mean that she must make withdrawals for emergencies when the market is low. Many financial experts advise keeping enough money in savings accounts, money market accounts, and short-term CDs to cover at least 3–6 months of your income. They may also recommend putting some savings into income producing investments like bonds.

Exercises

Find the product or sum.

1. $629 × 10
2. $2,198 × 9
3. $1,000 × 102.7%
4. $500 × 93.6%
5. $1,108 + $77
6. $521 + $48

State the market price, in dollars and cents, of each $1,000 bond below. Also state whether the bond is selling at a discount or premium.

7. 92.877
8. 89.231
9. 103.088
10. 102.662
11. 109.836
12. 88.114

Find the amount of money invested in each bond purchase below.

Madison County, $1,000 bonds:

13. 5 @ 91.445
14. 12 @ 88.331
15. 20 @ 106.292

Eggleston Power Company, $1,000 bonds:

16. 6 @ 99.323
17. 15 @ 94.494
18. 18 @ 102.313

Teasdale Transportation Authority, $500 bonds:

19. 24 @ 114.673
20. 8 @ 92.555
21. 12 @ 79.447

Solve.

22. Rob Adams invested in 25 bonds with a par value of $1,000 each. The quoted price for each bond was 110.345. His broker charged $3.50 per bond commission. How much did Rob invest?
23. Simone Tremont bought 8, $1,000 bonds at 88.563. No commission was shown. What was her total investment in the bonds?
24. Olaf Hansen bought 4, $1,000 bonds at 88.559. Two days ago the price of the bonds was 87.443. What was the amount of Olaf's investment in the bonds?

Leslie Ikwelugo buys a $1,000 bond at 105.874. The broker charges $3 commission per bond with a minimum of $30 commission per order.

25. What commission was Leslie charged?
26. What was the total amount she invested in the bond?
27. What is the amount of premium she paid on the bond?

Henry Schmidt bought 6, $500 bonds at 98.580.

28. What is his total investment in the bonds?
29. What discount did he receive on each bond?
30. **CRITICAL THINKING** If a bond promises a bondholder a guaranteed price at the maturity date, why may the market value be more or less than the par value?
31. **FINANCIAL DECISION MAKING** Corporations often use their land, buildings, or equipment as collateral for the money they borrow. If the loan is not repaid, the bondholders may take over the corporation's property. Since the collateral of a company backs these bonds, does that mean there is no risk involved in purchasing a bond?

Mixed Review

32. Find the sums and grand total.

$$\begin{array}{r} 24.0 + 16.0 + 12.5 + 9.2 \\ \underline{12.6} + \underline{22.7} + \underline{18.6} + \underline{6.3} \end{array}$$

33. Divide 1,560 by 27 to the nearest hundredth.

34. Divide 23.67 by 100.

35. Add: $\frac{3}{8} + \frac{5}{6}$.

36. What fractional part of 56 is 8?

37. Multiply $2\frac{3}{4}$ by $2\frac{2}{7}$.

38. Janice Ludlow bought the following number of bonds in a week: Mon., 4; Tues., 6; Wed., 6; Thurs., 5. How many bonds did she buy on Friday if the average number of bonds she bought each day was 5?

39. Tomas Reynoso spent 35.6% of his total income last year on housing. If his income last year was $67,800, how much did he spend on housing?

40. Vic Davis paid an annual premium of $11.80 per $1,000 for a $30,000 life insurance policy. His policy also paid a dividend of $29.50, which he used to reduce his premium. What net premium did Vic pay?

41. Risa Levine was injured and hospitalized for 8 days. Her total medical bill was $16,360. Risa's major medical coverage pays for 80% of medical expenses above a $500 deductible. How much does Risa have to pay?

42. Juan Imalgo was billed $125 for an office visit and eye examination and $339 for new eyeglasses. His group insurance policy had a deductible of $75 and a coinsurance rate of 25% on the visit and exam, but only allowed a maximum amount of $275 for glasses. What amount of the bill did Juan pay?

Photodisc/Getty Images

43. Suba Jaidka is a waitress and earned these tips last week: Tuesday, $55; Wednesday, $75; Thursday, $80; Friday, $120; Saturday, $135. What is the average amount of tips she earned per day?

44. Velma Reese's March 31 bank statement balance was $281.73. Her outstanding checks were for these amounts: $25.17, $19.75, $27.89. Velma deposited $125 late on March 31 in the bank's night deposit box. It was not opened by bank employees until the next day and did not appear on the bank statement. Reconcile the check register.

Reiko Wakui wants to buy a home for $175,000. She expects to make a 20% down payment and estimates her closing costs as: legal fees, $1,350; title insurance, $331; property survey, $275; inspection, $175; loan processing fee, $96; recording fee, $540.

45. What amount of mortgage loan will she need?

46. What amount of cash will she need when she buys the house?

7-5

Bond Interest

GOALS
- Calculate bond income
- Calculate bond yield
- Calculate total cost of bonds

KEY TERM
- current yield

Start Up

You can buy a \$1,000, 9.5% bond for 97.000 or a \$1,000, 10.5% bond for 108.000. Which offers the highest true rate of interest?

Photodisc/Getty Images

Math Skill Builder

Review these math skills and solve the exercises.

1 **Rewrite** percents as decimals.
Rewrite 95.141% as a decimal. 0.95141

1a. 102.597%

1b. 97.289%

2 **Add** dollar amounts.
Find the sum. \$2,890.80 + \$395 = \$3,285.80

2a. \$5,190 + \$56.16

2b. \$11,390.56 + \$298.88

3 **Multiply** dollar amounts by percents, whole numbers, and fractions.
Find the product. \$500 × 99.567% = \$500 × 0.99567 = \$497.835, or \$497.84
Find the product. \$1,000 × 8% × $\frac{1}{2}$ = \$1,000 × 0.08 × $\frac{1}{2}$ = \$40
Find the product. \$26.59 × 2 = \$53.18

3a. \$1,000 × 105.295%

3b. \$49.50 × 2

3c. \$500 × 97.114%

3d. \$1,000 × 9.5% × $\frac{1}{2}$

4 **Divide** dollar amounts by dollar amounts to find percents.
Find the percent, to the nearest tenth. \$83 ÷ \$946.80 = 0.0876, or 8.8%

4a. \$94.60 ÷ \$1,200

4b. \$37.94 ÷ \$10,000

Bond Income

Investors in bonds receive interest payments as income. Bond interest is often paid semiannually. The interest rate of a bond is based on the bond's par value. Since the par value is the principal, the interest formula is:

Interest = Par Value × Rate × Time

To find your bond income, find the interest you receive for one bond. Then multiply that result by the number of bonds you own.

Algebra *Tip*

To find the interest on a bond, you can use the simple interest formula:.

$I = P \times R \times T$

where P is the principal or the par value of the bond, r is the rate of interest, and t is the time in years.

EXAMPLE 1

Find the interest for one year on 5, \$1,000 par value, 9% bonds. Find the semiannual interest paid on 1 bond.

SOLUTION

Rewrite the interest rate as a decimal and multiply by the par value.

$I = \$1{,}000 \times 0.09 \times 1 = \$90$ interest for 1 year on 1 bond

Multipy the interest for 1 bond by the number of bonds owned.

$5 \times \$90 = \$450$ interest for 1 year on 5 bonds

If the interest is paid semiannually, the amount of each interest payment for this bond would be \$45.

$I = \$1{,}000 \times 0.09 \times \frac{1}{2} = \$45$ semiannual interest on 1 bond

✔ CHECK YOUR UNDERSTANDING

A. Alif Guilak owns 10, \$1,000, 9% bonds. What is his semiannual interest on the bonds?

B. Beatrice Grezlak bought 20, \$500, 8.5% bonds. What is her annual income from the bonds?

Bond Yields

One way to compare bond investments is to find the current yield of bonds. The **current yield** of a bond is found by dividing the bond's annual interest income by the bond's price.

Current Yield = Annual Income ÷ Bond Price

EXAMPLE 2

What is the current yield on a \$1,000, 7% Elgin Transit Company bond priced at 96.462? Round your answer to the nearest tenth of a percent.

SOLUTION

Multiply the face value of the bond price times the bond's interest rate.

$I = \$1{,}000 \times 0.07 = \$70$ annual income

Multiply the bond's face value times the bond price.

$0.96462 \times \$1{,}000 = \$964.62$ bond price

Divide the annual income by the bond price.

$\$70 \div \$964.62 = 00.0725 = 7.3\%$ current yield

✔ CHECK YOUR UNDERSTANDING

C. Crescent Company \$1,000, 9% bonds are offered at 101.585. What is the current yield, to the nearest tenth percent?

D. The semiannual interest on \$1,000 Lancaster Housing bonds is \$47.50. If you buy the bonds at 94.598, what is the current yield?

Total Cost of Bonds

When a bond is sold, whoever owns the bond on the next interest date receives the full amount of interest for the entire past interest period. When you buy a bond, you may have to pay the market price of the bond plus any interest that the bond has earned from the last interest date.

For example, if on April 1 you buy a bond that pays interest semiannually, you have to pay the seller for the accrued interest that he or she has already earned on the bond from January 1 through March 31. On July 1, the bond will pay you interest for the full 6 months. The interest for that first three months is called *accrued* interest.

Business *Tip*

Accrued interest is interest that has been earned but not yet paid.

EXAMPLE 3

Ed Martin buys 5, \$1,000, 8% bonds through a dealer at 102.797 plus accrued interest of \$20 per bond. The dealer charged \$3 commission per bond. What is the total cost of the bonds to Ed?

SOLUTION

Change the market price to a decimal and multiply by the par value.

$102.797\% = 1.02797$; $1.02797 \times \$1{,}000 = \$1{,}027.97$ price of one bond

Add the accrued interest, commission, and the price of one bond.

$\$1{,}027.97 + \$20 + \$3 = \$1{,}050.97$ cost of each bond

Multiply the total cost of each bond by the number of bonds purchased.

$\$1{,}050.97 \times 5 = \$5{,}254.85$ total cost of bond purchase

✔ CHECK YOUR UNDERSTANDING

E. Reba Neel buys 10, \$1,000, 9.7% bonds through a dealer at 97.272 plus accrued interest of \$24.25 per bond and commission of \$4 per bond. What is the total cost of the bonds to Reba?

F. Julio Pujols buys 20, \$1,000, 8% bonds on April 1 at 105.288 plus accrued interest from January 1. Commission was not shown. What is Julio's total cost for each bond?

Wrap Up ▶ ▶ ▶

The interest rate of both bonds is based on the par value of the bonds. You will receive \$1,000 × 9.5%, or \$95 as annual interest on the first bond. You will receive \$1,000 × 10.5%, or \$105 on the second bond. However, the market price of the first bond is only \$970. If you buy that bond, the true rate of interest is \$95 divided by the market price of the bond, or 9.8%, rounded to the nearest tenth percent. The true rate of interest on the second bond is \$105 divided by \$1,080, or 9.7%, rounded to the nearest tenth percent.

Communication

Municipal bonds are bonds that are issued by state and local governments and government agencies. Write complete sentences to answer each of the following questions.

1. Why is the interest rate paid on municipal bonds often lower than the interest rates paid on bonds of comparable quality issued by corporations?
2. What is the advantage of buying municipal bonds?

Write a brief memo to another person that includes the answers to these questions.

Exercises

Find the annual income in each problem.

1. 14, \$1,000, 6% bonds
2. 6, \$1,000, 10% bonds
3. 8, \$1,000, 12% bonds
4. 2, \$500, 7.25% bonds
5. 20, \$500, 9% bonds
6. 15, \$1,000, $8\frac{1}{2}$% bonds
7. 5, \$1,000, 9.25% bonds
8. 12, \$1,000, 11.5% bonds
9. What is the semiannual income from six \$1,000, 5.5% bonds?
10. You own 30 bonds with a par value of \$1,000 each and paying 9.75% interest. Find your semiannual income from these bonds.

Find the total investment and the total annual income from the investment.

	Bonds Owned	Par Value per Bond	Price Paid	Total Investment	Interest Rate	Annual Income
11.	5	\$1,000	99.246		9%	
12.	10	\$1,000	104.932		12%	
13.	30	\$1,000	107.253		$12\frac{1}{2}$%	
14.	45	\$1,000	94.342		8.7%	

Find the current yield on each bond to the nearest tenth of a percent.

	Par Value	Interest Rate	Price Paid	Current Yield
15.	\$1,000	10%	91.899	
16.	\$1,000	8.5%	104.363	
17.	\$1,000	$9\frac{1}{2}$%	112.008	
18.	\$500	7.8%	92.826	

19. How much is each interest payment on a \$500, 8% bond if the interest is paid semiannually on June 1 and December 1?

20. What estimated and actual annual interest would you get from 10, \$1,000 par value bonds that pay 6.8% interest?

21. A \$1,000 bond, paying 8% interest, was bought at 78.569. What is the current yield to the nearest tenth percent?

22. What is the current yield, to the nearest tenth percent, on a \$1,000, 11.2% bond bought at 108.289?

23. What is the current yield, to the nearest tenth percent, on a \$500, 9% bond bought at 95.976?

24. **STRETCHING YOUR SKILLS** E.Print, Inc. \$1,000, $9\frac{1}{4}$% bonds can be purchased at 103.976. How much money must be invested in the bonds to produce an annual income of \$1,850?

25. **STRETCHING YOUR SKILLS** What amount must be invested in Poe County \$1,000, 9% bonds at 80.360 in order to earn an annual income of \$2,250?

26. Denny Lensing bought 10 Brittle Company \$1,000 par value, 13% bonds at 150.883. Interest on these bonds is paid semiannually on January 1 and July 1. What semiannual interest payment will Denny receive from this investment?

27. On April 1, Alan Durston buys 20, \$1,000, 8% bonds at 95.089, plus accrued interest from January 1. No commission is shown. What total amount does Alan spend for the bonds?

28. **FINANCIAL DECISION MAKING** You can invest in a 15-year bond with a current yield of 8.5% or a 6-month CD with an APR of 6.5%. Why might you invest in the CD? Why might you invest in the bond?

Mixed Review

29. Subtract $\frac{2}{5}$ from $\frac{4}{9}$.

30. Divide $5\frac{1}{5}$ by $2\frac{1}{2}$.

31. What number is 10% greater than 55?

32. June Silva borrows \$450 and agrees to repay the loan in 36 payments of \$15.50 each. How much is the finance charge on the loan?

7-6

Stocks

GOALS

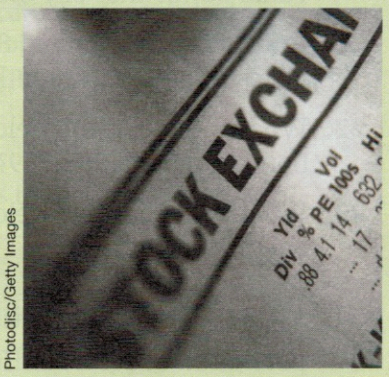
- Calculate the cost of stock purchases
- Calculate annual stock dividends
- Calculate the yield on stock investments
- Calculate the proceeds from the sale of stock

KEY TERM

- market price

Start Up ▶ ▶ ▶

You and a friend are reading a newspaper article describing an Internet music provider. The article states that the company's stock started last year at \$21 and rose to \$53 at the end of the year. Your friend said, "Boy, if I had bought 100 shares of that stock, I would have made \$3,200." Is your friend right?



Photodisc/Getty Images

Math Skill Builder

Review these math skills and solve the exercises that follow.

1. **Multiply** dollar amounts by percents and whole numbers.
Find the product. $\$14.50 \times 200 = \$2{,}900$
Find the product. $\$100 \times 2.4\% = \$100 \times 0.024 = \$2.40$

1a. $\$72.58 \times 100$ **1b.** $\$117 \times 500$

1c. $\$1{,}000 \times 4.5\%$ **1d.** $\$100 \times 2.14\%$

2. **Divide** dollar amounts by dollar amounts to find percents, to the nearest tenth.
Find the quotient. $\$14 \div \$350 = 0.04$, or 4%

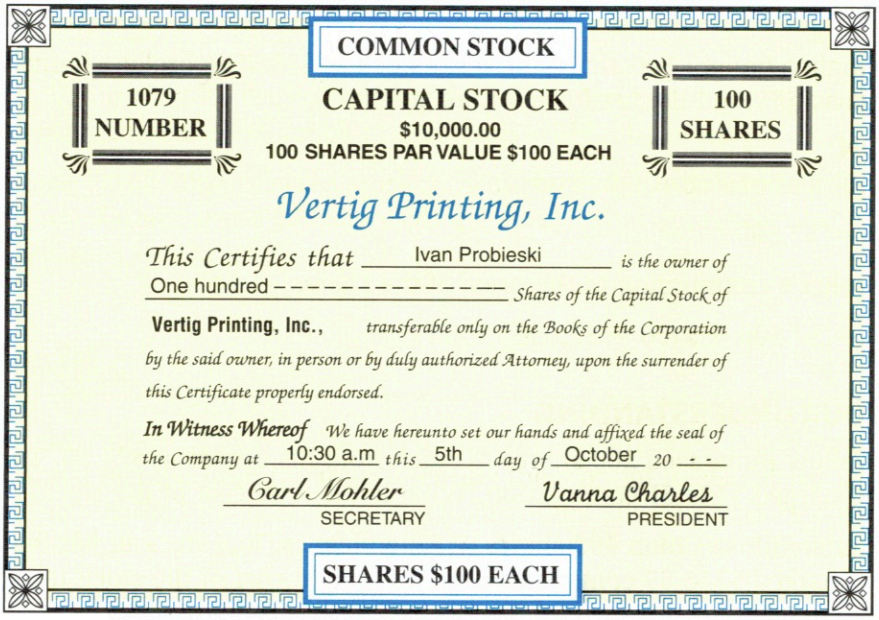
2a. $\$8.25 \div 200$ **2b.** $\$15.23 \div \$428$

Purchasing Stock

Companies issue shares of stock to raise money, which might be used to expand or to offer new products. Investors who buy the shares are called *stockholders.* Each stockholder gets a stock certificate that shows on its face the number of shares it represents. A stock certificate is shown at the top of the next page.

Business *Tip*

Stockholders are also called shareholders.



Stockholders usually buy and sell their shares through a broker. The price at which a stock sells is called the **market price** or *market value* and is shown in stock tables on the Internet and in some daily newspapers.

Highest and lowest prices for past 52 weeks

Net difference between last price for this day and last price of yesterday

52 Weeks High	52 Weeks Low	Stocks	Div.	Sales in 100s	High	Low	Last	Net Change
45.28	29.33	Amicio Corp.	2	387	34.40	32.82	33.50	−.50
15.25	6.98	Bellin-Carr, Inc.		483	12.34	10.50	11.23	−.75
105.10	88.98	Crest Industries	4.75	825	103.23	99.46	101.54	+.27
22.34	8.25	Technet Co.	1.25	346	10.55	10.35	10.35	−.16
33.37	12.45	Unser, Inc.	.45	872	33.37	31.68	33.37	+1.05
87.28	68.41	Gen. Prod. Co.	2.50	226	82.45	82.13	80.42	+.54

Corporation name usually abbreviated

Current dividend rate in dollars per year

Shares sold (in hundreds) for the day

Highest and lowest prices at which a sale was made for the day

Last or closing price at which a sale was made

When you buy stock through a broker, the total cost of the stock is the market price of the stock plus the broker's commission.

Total Cost = Market Price + Commission

The amount of a broker's commission depends on the services the broker provides, the price of the stock, and the number of shares bought. As in bonds, discount and online brokers usually charge lower commissions but give less service to customers than full service brokers.

Business *Tip*

Share prices can be found at many web sites. For starters, visit the sites for the *Wall Street Journal* (www.wsj.com) or the New York Stock Exchange (www.nyse.com).

EXAMPLE 1

Velma D'Anglico bought 500 shares of Vesta stock at $15. The broker charged her $106 commission. Find the total cost of the stock.

SOLUTION

Multiply number of shares times price.

$500 \times \$15 = \$7{,}500$ total price of shares

Add the broker's commission to the price of the shares.

Total Cost $= \$7{,}500 + \$106 = \$7{,}606$ total cost of shares

✔ CHECK YOUR UNDERSTANDING

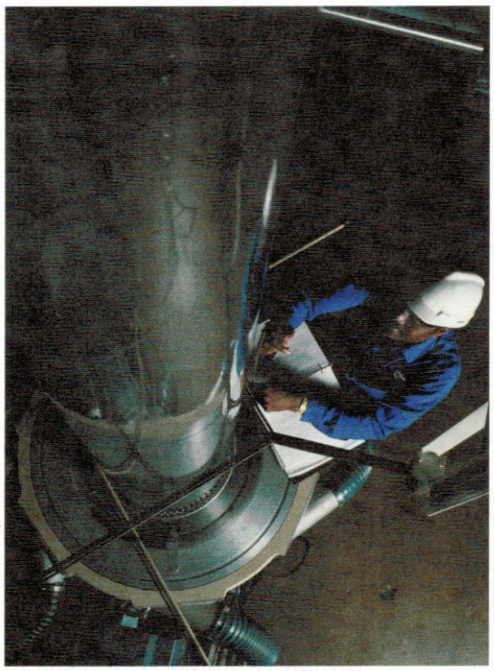
A. Trent Vallow purchased 200 shares of stock from his broker at $24.50. The broker charged $123.51 commission. What is the total cost of the stock?

B. A broker sold Lisa Colon 400 shares of Roly Plastics, Inc. stock at $31.89. Lisa's broker charged $246.89 commission. Find the total cost of the stock to Lisa.

Stock Dividends

Unlike bondholders' investments, the money invested in stock does not have to be repaid. Stockholders are owners of the company, not lenders. However, stockholders have a right to share in company profits. These profits are distributed to shareholders as *dividends* and are usually paid quarterly.

Many corporations issue two classes of stock—common stock and preferred stock. A corporation sets a *preferred stock*'s dividends when it is first issued. *Common stock* is the ordinary stock of a corporation and does not have a set dividend. There is no guarantee that dividends will be paid to either class of stockholder. When dividends are paid, they go first to shareholders of preferred stock. Dividends may be shown either as a percent of a stock's par value or as an amount of money per share. For stock with no par value, the dividend is always an amount per share.



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EXAMPLE 2

Cecile Ware owns 100 shares of Teleos Communications common stock, par value $100. If a dividend of 2.5% is declared, how much should Cecile get in dividends?

SOLUTION

Change the dividend percent to a decimal and multiply by the par value.

$2.5\% \times \$100 = 0.025 \times \$100 = \$2.50$ dividend on one share

Multiply the dividend on one share by the number of shares.

$100 \times \$2.50 = \$250$ total dividend

✔ CHECK YOUR UNDERSTANDING

C. Emile Van Tassel owns 600 shares of Brunis Imaging Co. common stock with a par value of $100. Brunis Imaging declares a dividend of 3.7% on the par value to shareholders. How much in dividends will Emile receive?

D. Dome Petroleum preferred stock pays a quarterly dividend of $1.50 per share. If Sara Karadic owns 800 shares of the stock, what amount will she receive in dividends for the year?

Stock Yields

The yield, or rate of income, received from an investment is found by dividing the annual income from the investment by the amount invested. For stocks, the investment is the total cost of the stock, including any expenses or commission paid in obtaining the stock. The income is the amount of annual dividends.

Yield = Annual Dividends ÷ Total Cost of Stock

EXAMPLE 3

Sandra bought 10 shares of Calcon, Inc. stock at $25. Her broker charged her $28 commission. If the stock pays an annual dividend of $1.20, what is its yield?

SOLUTION

Multiply the number of shares by share price and add commission.

$(10 \times \$25) + \$28 = \$278$ total cost of the stock

Multiply the annual dividend by the number of shares.

$10 \times \$1.20 = \$12$ total annual dividend

Divide the total annual dividend by the total cost of the stock. State the yield as a percent to the nearest tenth percent.

Yield = $\$12 \div \$278 = 0.0431$, or 0.043, or 4.3% annual yield to nearest tenth percent

✔ CHECK YOUR UNDERSTANDING

E. Vladan Kortic bought 600 shares of stock at $11.35. His broker charged $182.60 commission. The stock pays a quarterly dividend of $0.12. What is the annual yield, to the nearest tenth percent?

F. Penina Kabamba purchased 1,000 shares of Peltor, Inc. stock at $20.80. Her broker charged her $408.23 commission. If the stock pays an annual dividend of $0.62, what is its annual yield, to the nearest tenth percent?

Stock Sales

When you sell stock through a broker, you pay a commission. You may also pay charges such as a service fee and a *Securities and Exchange Commission (SEC) fee.* Your state may charge a transfer tax. When you buy stock, you do not pay a transfer tax or an SEC fee. When you sell stock, the net proceeds is the market price less the commission and all other charges (service fee, SEC fee, transfer tax).

Net Proceeds = Market Price − (Commission + Other Charges)

EXAMPLE 4

Find the net proceeds from the sale of 100 shares of Danbury Corporation stock at $30.25 with commission and other charges of $86.

SOLUTION

Multiply number of shares by market price. $100 \times \$30.25 = \$3{,}025$ total sale

Subtract the commission and other charges from the total sale.

Net Proceeds = $\$3{,}025 - \$86 = \$2{,}939$

The profit or loss on a sale of stock is the difference between the total cost of purchasing the stock and the net proceeds. If the amount of the net proceeds is greater than the total cost, there is a profit. If it is less than the total cost, the result is a loss.

Profit = Net Proceeds − Total Cost or Loss = Total Cost − Net Proceeds

EXAMPLE 5

Find the profit or loss from the sale of the Danbury Corporation stock in Example 4. You bought the 100 shares of stock originally at $21.50 a share and paid a commission of $68.55.

SOLUTION

Multiply the price per share by the number of shares and add the commission.

$100 \times \$21.50 = \$2{,}150$ total price of stock

$\$2{,}150 + \$68.55 = \$2{,}218.55$ total cost of stock

The net proceeds, $2,939, is greater than the total cost, $2,218.55, so find the profit.

Profit = $\$2{,}939 - \$2{,}218.55 = \$720.45$ profit from sale of stock

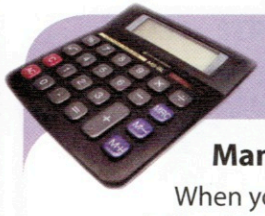
✔ CHECK YOUR UNDERSTANDING

G. You bought 100 shares of Pendel preferred stock at $14.70. The commission charge was $54. You sold the same shares later at $21.45. The commission and other fees on the sale were $71. What was the profit or loss on the stock?

H. Jorge Venteria bought 300 shares of Silver Forge common stock at $41.80 and was charged a commission of $243. He later sold the stock for $39.12. The commission and fees on the sale were $235. What was Jorge's profit or loss?

Wrap Up ▶ ▶ ▶

Your friend overlooks the commission on the purchase of the shares and commission and fees on the sale of the shares. The profit would be reduced by these amounts. Also, you don't make a profit or loss until you actually sell the shares. If your friend checked the current price of the stock, he or she might find that the price had fallen to $15 a share. Unless the stock was sold at year-end, your friend would have made no profit. Unless the stock is sold now, your friend would suffer no loss on the stock.



Financial Responsibility

Managed Funds

When you have money to invest and would like an expert to make decisions to help you make your money grow, a managed fund is a good choice. A *managed fund* is an investment fund that is managed for you by a professional investments manager. This manager constantly researches the market to know when to buy and when to sell, who to buy and who to sell.

The greatest benefit of a managed fund is that your money is pooled with other investors into a single account that creates a large sum of money to invest into a diversified group of funds. If you had $1,000 to invest, you would likely only be able to purchase the stock of one company. If that company performs poorly, you will lose your money. If you invest that $1,000 into a managed fund, you will likely invest in as many as 20–50 companies, both domestic and international companies. And, more importantly, a professional will monitor your investments and make changes to minimize your losses and maximize your gains.

Exercises

Perform the indicated operation.

1. $\$5{,}478 + \$56.88$
2. $\$45{,}298 - \$1{,}497$
3. $\$2{,}500 \times 1.5\%$
4. Find the percent, to the nearest tenth: $\$5.60 \div \$500$

Find the total cost of each stock purchase.

	Number of Shares	Name of Stock	Market Price	Commission	Total Cost
5.	300	Reinhold	$41.55	$241.55	
6.	100	Seibold	$22.44	$69.80	
7.	100	Danville	$17.52	$39.20	
8.	50	Net Managers	$61.28	$76.30	
9.	200	BPM	$110.58	$143.90	
10.	800	Monterey	$14.75	$268.85	
11.	400	Nextsand	$5.88	$42.20	
12.	150	Streiser	$32.94	$71.20	
13.	35	Tolker	$44.26	$40.80	
14.	200	Newdays	$58.44	$116.40	

15. **STRETCHING YOUR SKILLS** A discount broker offers 40% off the $117 commission charged by a full service broker to handle the purchase of 200 shares of Epsonique at $22.50. How much could a buyer save by purchasing from the discount broker?

Find the total annual dividend received by each shareholder.

	Shares Owned	Par Value per Share	Annual Dividend Rate	Dividend
16.	100	$100	5%, annually	
17.	800	$100	8%, annually	
18.	120	$50	4.5%, annually	
19.	500	—	$0.75 per share, quarterly	
20.	100	—	$1.50 per share, quarterly	

Solve.

21. Sun Fabrications declares a dividend of $3.50 per share on its common stock. If Jules Kortel owns 400 shares of the stock, what amount will he receive in dividends?

22. Karen Hedrick owns 300 shares of Tilden Electronics preferred stock. If the stock pays a quarterly dividend of $1.20 a share, what is the total amount that Karen will receive in a year?

Find the yield on the investment in each of the following stocks. Round all answers to the nearest tenth of a percent.

	Total Cost per Share	Par Value per Share	Dividend Rate	Dividend Payable	Yield
23.	$120	$100	6%	Annually	
24.	$80	$100	3%	Annually	
25.	$50	—	0.62 per share	Quarterly	
26.	$26	—	0.40 per share	Quarterly	
27.	$32	—	0.55 per share	Quarterly	

Tien Niu bought 500 shares of stock at $47.75 a share. She paid a discount broker a commission of $26 for the purchase. The stock pays an annual dividend of 5% on a par value of $100.

28. What total dividend does Tien get from the 500 shares?

29. What yield, to the nearest tenth percent, does Tien earn on this investment?

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Sobal Chemical Company preferred stock sells for $38 and pays an annual dividend of 2.7% on a par value of $100. Elgin Equipment Corporation preferred stock has a market price of $18.25 and pays a quarterly dividend of $0.19.

30. Which stock earns a higher yield?

31. How much higher, to the nearest tenth percent?

32. **STRETCHING YOUR SKILLS** What is the rate of income on a share of preferred stock that costs $180 and pays a semiannual dividend of $7.20 a share?

INTEGRATING YOUR KNOWLEDGE Aegis Security Company common stock pays a regular annual dividend of $2.50 a share.

33. How many shares must you buy to get an annual income of $1,000 from the investment?

34. What total investment will you make in the stock if you buy the amount of shares in Exercise 35 at $52.50 and pay $78 per 100 shares for commission?

Find the profit (+) or loss (−) in each of these sales.

	Name of Stock	Shares Traded	Selling Price	Commission & Other Fees	Total Cost of Purchase	Profit/Loss
35.	RMB Plastics	200	42.44	$172.88	$7,628.12	
36.	eBuy, Inc.	300	11.50	115.73	$1,809.25	
37.	Solaris Corp.	400	17.10	165.97	$7,118.90	
38.	DigiNet	50	28.25	58.60	$1,178.34	
39.	Roces Mfg.	100	37.40	29.95	$3,165.22	

40. **CRITICAL THINKING** Explain the difference between a bond holder and a stockholder of a corporation.

STRETCHING YOUR SKILLS You bought 400 shares of stock for a total cost of $8,120 and kept the stock for 3 years during which time you received quarterly dividends of $0.26 per share. You sold the stock and received net proceeds of $9,215.

41. What total dividends did you receive while you owned the stock?

42. What is your profit on the sale of the stock?

43. What is your total gain from owning and selling the stock?

Mixed Review

44. Divide 3,600 by 21.4, rounded to the nearest tenth.

45. $482 is what percent of $24,800, to the nearest tenth percent?

46. 42 increased by 11.25% of itself is what number?

47. Louise Alvarez bought 200 shares of 8% preferred stock with a par value of $100. What is her annual dividend income?

48. The annual premium for Lee Nomi's health insurance plan is $3,870 for hospitalization and basic medical; $1,845 for surgery and major medical; and $1,048 for pharmacy benefits. Lee pays 39% of the premium. What is the total amount that Lee pays each month for health insurance coverage?

7-7

Mutual Funds

GOALS

- Calculate the total investment in a mutual fund
- Calculate the amount and rate of commission
- Calculate profit or loss from mutual fund investments

KEY TERMS

- mutual fund
- net asset value

Start Up ▶▶▶

Assume you collect baseball cards. Identify strategies you might use to have a good chance of ending up with the trading card of a future superstar.

Jason Figert/Shutterstock.com

Math Skill Builder

Review these math skills and solve the exercises that follow.

1. **Subtract** dollar amounts.
Find the difference. $1,542 − $1,312 = $230

1a. $2,078 − $1,993 **1b.** $12,307.87 − $4,110.57

2. **Multiply** dollar amounts by decimals.
Find the product. $35.17 × 45.135 = $1,587.397, or $1,587.40

2a. $14.29 × 325.112 **2b.** $8.31 × 28.922

3. **Divide** dollar amounts to find a percent.
Find the quotient as a percent, to the nearest tenth.
$32.28 ÷ $460 = 0.07, or 7.0%

3a. $34.80 ÷ $625 **3b.** $19.77 ÷ $822

Total Investment in a Mutual Fund

Mutual fund investment companies use the money from investors to buy stock in many companies. By investing in many companies, the mutual fund increases its chances of buying stocks that will be profitable.

There are many different kinds of mutual fund companies. Some have aggressive growth goals. Others choose to maximize the income from shares held. Some mutual funds specialize in certain sectors of the economy, such as the health sector. Others buy stock from many different types of organizations and from many different sectors of the economy.

Mutual fund shares are traded based on their net asset values. The net assets are the total value of the fund's investments less any debts it has. The **net asset value**, or NAV, is found by dividing the net assets by the number of shares held by stockholders.

For example, a fund with net assets of \$10,000,000 and 500,000 shares issued will have a net asset value of \$20 (\$10,000,000 ÷ 500,000 = \$20).

Mutual fund NAVs are published on the financial pages on the Internet and in some daily newspapers.

Fund Name	NAV	Offer Price
Ameris Growth	10.12	10.96
Banner Income	29.70	30.88
Jantzen High Yield	11.85	12.38
Mercer International	16.58	N.L.
Overland Technology	7.27	N.L.
Parkson Equity	9.27	N.L.
Strand Balanced	10.15	10.47
Tubman Health	32.23	N.L.

Two types of mutual funds are shown in the table: *no-load funds* and *load funds*. The term *load* means commission. No-load funds are sold without a commission and have the abbreviation "N.L." in the Offer Price column. When you buy load funds, you pay the amount shown in the Offer Price column, which includes a commission charge.

To find the total investment made in no-load funds, multiply the number of shares by the NAV. For load funds, multiply the number of shares by the offer price.

Total Investment in No-Load Funds = No. Shares × NAV

Total Investment in Load Funds = No. Shares × Offer Price

EXAMPLE 1

Alberto Allende bought 300 shares of Parkson Equity Fund (see table above) and 500 shares of Ameris Growth Fund. What is Alberto's total investment in these mutual funds?

SOLUTION

Multiply the number of shares of Parkson Equity by its NAV.

$300 \times \$9.27 = \$2{,}781$ total investment in no-load fund

Multiply the number of shares of Ameris Growth by its offer price.

$500 \times \$10.96 = \$5{,}480$ total investment in load fund

Add the investments in the two mutual funds.

$\$2{,}781 + \$5{,}480 = \$8{,}261$ total investment in mutual funds

✔CHECK YOUR UNDERSTANDING

A. Shizu Wakichi purchased 400 shares of no-load Mellon Technology Fund at its NAV of $17.35. What was her total investment in the fund?

B. Nicolas Davila bought 1,000 shares of a load fund, Allied Industries Fund, at its offering price of $26.74. What was his total investment in the fund?

Amount and Rate of Commissions

When you buy no-load funds, you are not charged a commission. For load funds, the commission is the difference between the net asset value and the offer price. To find the rate of commission on a load fund's purchase, divide the commission by the offer price.

Commission = Offer Price − Net Asset Value

Rate of Commission = Commission ÷ Offer Price

EXAMPLE 2

What is the rate of commission, to the nearest tenth percent, on Banner Income Fund with a net asset value of $29.70 and an offer price of $30.88?

SOLUTION

Subtract the net asset value from the offer price.

$30.88 − $29.70 = $1.18 amount of commission

Divide the commission amount by the offer price.

$1.18 ÷ $30.88 = 0.0382, or 3.8% rate of commission

✔CHECK YOUR UNDERSTANDING

C. Rosser Midcap Fund has a NAV of $9.45 and an offer price of $9.87. What is the rate of commission, to the nearest tenth percent?

D. Tanella Yaou bought Security Real Estate Fund for $45.18. The fund's NAV was $43.86 at the time. What rate of commission, to the nearest tenth percent, did Tanella pay?

Profit or Loss from Mutual Fund Investments

When shares are *redeemed,* or sold back to the mutual fund company, the investor is paid the net asset value. The proceeds from the sale are found by multiplying the net asset value by the number of shares redeemed.

Proceeds = Number of Shares × Net Asset Value

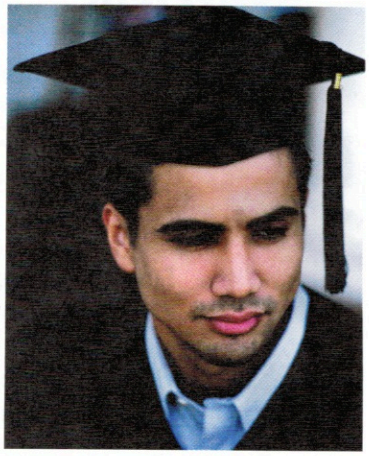
The profit or loss from owning mutual fund shares is calculated by finding the difference between the proceeds and the total amount invested. If the proceeds exceed the investment, there is a profit. If the amount invested is larger than the proceeds, there is a loss.

Profit = Proceeds − Amount of Investment

Loss = Amount of Investment − Proceeds

EXAMPLE 3

Find the proceeds from the sale of 100 shares of a mutual fund with a net asset value of \$8.50. Find the amount of the profit or loss if the total investment in the 100 shares is \$675.



Photodisc/Getty Images

SOLUTION

Multiply the number of shares by the net asset value.

$100 \times \$8.50 = \$850$ proceeds

The proceeds, \$850, is greater than the amount of investment, \$675, so find the profit.

Profit $= \$850 - \$675 = \$175$ Profit

✔ CHECK YOUR UNDERSTANDING

E. Upon graduation, Todd redeemed 300 shares of a mutual fund at \$17.22. His total investment in the shares was \$4,391.10. What was his profit or loss?

F. Ping-lin Sheng redeemed his 500 shares of Madison Capital Fund for \$39.45 a share. His total investment in the shares was \$19,922.25. What was his profit or loss on the redemption?

Wrap Up ▶ ▶ ▶

One strategy might be to purchase every trading card for a season, which is similar to the diversification strategy practiced by many mutual funds. Another strategy might be to buy only the cards of players on those teams that were contenders for the playoffs, which is similar to mutual funds investing in businesses that are in sectors that are likely to do well in a year. Another strategy might be to purchase the trading cards of players who show early success, which is similar to a mutual fund's practice of investing in companies with demonstrated potential.

TEAM Meeting

Some problems are simplified if you can find a pattern and use it to answer questions.

Suppose you own stock and are thinking of selling it. You could look for patterns that might help you make a decision. You have tracked its selling price and dividends.

	Jan. 1	April 1	July 1	Oct. 1	Dec. 31
Selling Price	25.25	22.50	20.87	18.38	19.25
Dividends	2.1%	1.4%	0.5%	3.2%	3%

Form a team with another student to discuss the following questions: (a) What patterns do you see? (b) Would you have sold the stock in July? (c) If today were January 2, would you sell the stock? Explain your reasoning.

Exercises

Find the difference.

1. $4,089 − $3,415

2. $34,551 − $29,796

Find the product.

3. $16.32 × 108.55

4. $7.24 × 44.784

Find the percent, to the nearest tenth.

5. $45.12 ÷ $193

6. $62.19 ÷ $525

Using the information given in the Mutual Fund NAV table, find the total investment in these mutual fund purchases.

	Mutual Fund	Number Shares	Total Investment
7.	Ameris Growth	400	
8.	Banner Income	132	
9.	Jantzen High Yield	800	
10.	Mercer International	260	
11.	Overland Technology	100	
12.	Parkson Equity	200	
13.	Strand Balanced	500	

14. Allie Jenkins bought these technology sector shares of New Economy Fund, a no-load mutual fund, on different days: 70 shares, NAV $39.78; 200 shares, NAV $41.52; and 80 shares, NAV $42.15. What was her total investment in the fund?

15. Wilson Growth, a no-load fund, has a net asset value of $42.52. Wilson Income, a load fund, is quoted with a net asset value of $30 and an offer price of $32.12. What total investment would be made if 100 shares each of Wilson Growth and Wilson Income were purchased?

16. Ridge Health Sector Fund is quoted at 12.16 NAV, 12.48 offer price. To the nearest tenth of a percent, what commission rate is charged?

17. Your broker quotes Stamper International Fund at these prices: NAV, 7.03; offer price, 7.40. Find the rate of commission.

Find the amount of commission and the rate of commission, to the nearest tenth percent, for each of these mutual fund shares.

	Mutual Fund	NAV	Offer Price	Amount of Commission	Rate of Commission
18.	Cyber Net Fund	18.87	19.26		
19.	Draper Energy Fund	51.12	53.76		
20.	Ethan Pacific Fund	88.75	97.00		
21.	Wu Equity Fund	68.64	71.84		

22. A commission of $3.52 is charged for a mutual fund with an offer price of $45.25. What is the commission rate, to the nearest tenth percent?

The Bradford Energy Fund has a current NAV of $47.48. Edward Carter redeemed the 1,280 shares that he had bought for a total cost of $42,792.

23. What were Edward's proceeds?

24. Find his profit or loss.

The Columbia Fund had a NAV of $47.64 and an offer price of $48.60 on the day that Sally Worth bought 500 shares of the fund. Six months later, the fund was quoted at these prices when Sally redeemed her shares: NAV, $48.66; offer price, $49.68.

25. What proceeds did Sally receive?

26. What amount of profit or loss did Sally make?

27. **FINANCIAL DECISION MAKING** Many financial advisers suggest that you evaluate your personality and your tolerance for risk to help you decide what kind of investments you should make. Describe the risk differences between purchasing stocks and shares in a mutual fund. Evaluate which investment your personality is best suited for.

Photodisc/Getty Images

Mixed Review

28. 250 is what part greater than 200?

29. 420 is what percent of 4,800?

30. Write $\frac{44}{30}$ as a decimal, rounded to the nearest tenth.

The Roswell Income Fund trades at a net asset value of $34.88 and an offer price of $36.46.

31. What commission amount is paid per share?

32. To the nearest tenth percent, find the commission rate.

33. Manfred Tulley bought 300 shares of Tempe Growth Fund for $21,577.50. Two years later he sold his shares at a $65.25 NAV. What was his profit or loss?

Gazi Ecevit purchased 200 shares of common stock in the Rivalo Company at $43.68 through an online broker. The commission was $29.95. He later sold the same stock at $41.25, paying commission and fees of $32.25.

34. What was Gazi's total cost for the stock?

35. What amount did Gazi receive as net proceeds from the sale?

36. What was Gazi's profit or loss on the sale?

Killean paid one and a half month's rent as a security deposit to rent an apartment for $695 a month. His utility bills are estimated to be an average of $129 a month. His annual renter's insurance premium is $239.

37. What is the annual cost Killean will pay to live in this apartment?

38. What is the monthly cost for Killean? Round to the nearest dollar?

7-8

Real Estate

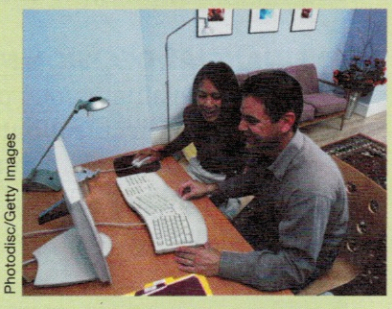
GOALS

- Calculate net income from real estate investments
- Calculate the rate of return on real estate investments
- Calculate the monthly rent to be charged

KEY TERM

- capital investment

Janice and Jim Canter would like to move to a larger house. They are considering keeping and renting their present house as an investment. They wonder whether renting the house would be a good investment for them financially. What factors might they consider in making this decision?



Photodisc/Getty Images

Math Skill Builder

Review these math skills and solve the exercises that follow.

1. **Add** dollar amounts.
   Find the sum. $450 + $2,398 + $941 = $3,789

   1a. $1,290 + $4,208 + $638 + $2,108

   1b. $289 + $6,792 + $749 + $3,184

2. **Subtract** dollar amounts from dollar amounts.
   Find the difference. $9,600 − $7,895 = $1,705

   2a. $11,893 − $9,215

   2b. $6,182 − $4,297

3. **Multiply** dollar amounts by whole numbers and percents.
   Find the product. $249.20 × 12 = $2,990.40
   Find the product. $246,500 × 3% = $246,500 × 0.03 = $7,395

   3a. $487 × 12

   3b. $134,800 × 2.5%

   3c. $629 × 12

   3d. $89,345 × 2.7%

4. **Divide** dollar amounts by dollar amounts to find a percent.
   Find the quotient, to the nearest tenth percent.
   $2,400 ÷ $45,000 = 0.0533, or 5.3%

   4a. $3,680 ÷ $56,700

   4b. $2,734 ÷ $38,400

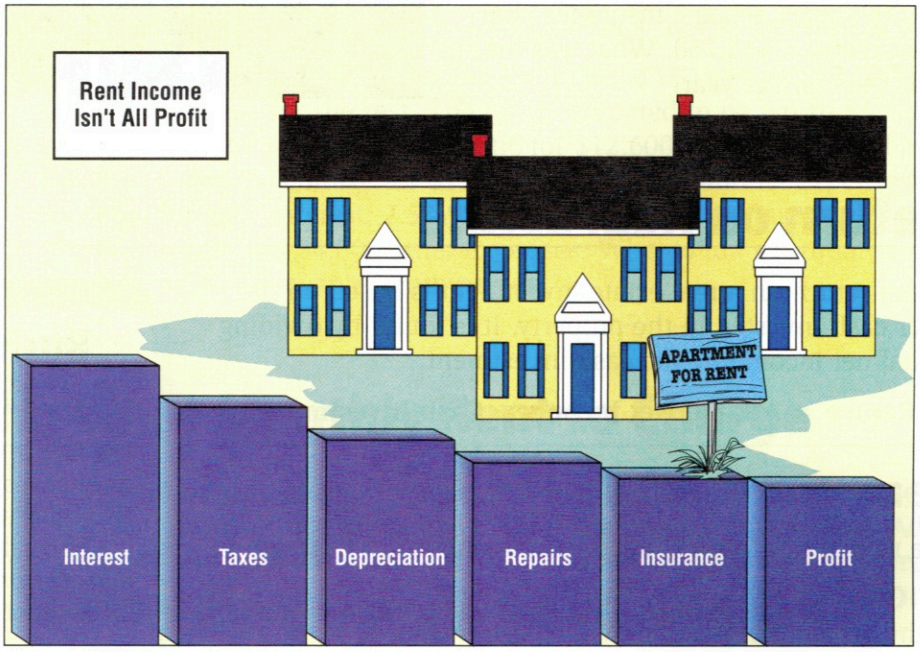
Net Income from Real Estate

When you invest in real estate, the rent you receive is your gross income from the investment. Your net income is the amount left after you pay all the expenses of owning the property.

The following table shows that only part of the money you collect as rent is profit. The rest of the money is usually used to pay for taxes, repairs, insurance, and interest on a mortgage. Since buildings wear out because of age and use, you will also have to calculate depreciation.

You usually calculate your income and expenses on an annual basis. The annual net income is the amount left after deducting the annual expenses from the annual rental income.

Annual Net Income = Annual Rental Income − Annual Expenses



EXAMPLE 1

Chieko Beppu bought a house and lot for $150,000. She made a $30,000 cash down payment and got a $120,000 mortgage for the balance. She rented the house to a tenant for $1,500 a month. Her annual payments for taxes, repairs, insurance, interest, depreciation, and other expenses totaled $14,100. What annual net income did she earn?

SOLUTION

Multiply rent by 12.

$12 \times \$1{,}500 = \$18{,}000$ annual rental income

Subtract the annual expenses from annual rental income.

Annual Net Income $= \$18{,}000 - \$14{,}100 = \$3{,}900$ annual net income

✔ CHECK YOUR UNDERSTANDING

A. Ursula Pavlok bought a building with four stores in it and the lot on which it stands for $850,000. During the first year, she received $2,300 a month in rent for each store unit. Her expenses for the year were: mortgage interest, $102,000; 2% depreciation on the building valued at $650,000; taxes, repairs, insurance, and other expenses, $74,500. Find her net income or loss for the year.

B. Melvin Weisbaum bought a house and lot in a resort area for $288,000. He paid $72,000 in cash and got a mortgage for the rest. He rented the house to a tenant for $3,800 a month. For the first year, Melvin's expenses were: mortgage interest, $19,200; 3% depreciation on the house, valued at $198,000; taxes, repairs, insurance, and other expenses, $15,750. What was his net income for the year?

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Rate of Return on Real Estate

The rate of return on a real estate investment is based on the money or cash invested in the property. It is found by dividing the annual net income by the cash investment.

Rate of Return = Annual Net Income ÷ Cash Investment

Business Tip

The rate of return on an investment is also called the *yield*. It is also called the *rate of income* on an investment.

EXAMPLE 2

Find the rate of return for Chieko Beppu's house in Example 1.

SOLUTION

Divide the annual net income by the cash invested.

Rate of Return = $3,900 ÷ $30,000 = 0.13 or 13% rate of return

As a property owner, you spend money on both capital investments and expenses. **Capital investment** is the amount of cash you originally invested plus money you spend for improvements that increase the property's value. Adding a room or a garage to a rental house are examples of capital investments.

Business Tip

Capital investment is an investment in anything that cannot easily be turned into cash and which is usually held by the investor for longer than one year.

Money spent for repairing or replacing broken items does not increase the value of property. It is an expense of owning the property. The money paid returns the property to its original condition. Expenses include repainting the house, replacing a broken sidewalk, and repairing leaking faucets.

To find the return on investment after you have made capital investment improvements in a property, you must add the cash spent on the improvements to your original cash investment.

EXAMPLE 3

Suppose that on buying the rental house, Chieko (see Example 1) spent an additional $2,700 in cash to add a deck to her rental house. What would the rate of return on her real estate investment be?

SOLUTION

Add the two cash amounts invested in the house.

$30,000 + $2,700 = $32,700 capital investment in house

Divide the annual net income by the capital investment.

Rate of Return = $3,900 ÷ $32,700 = 0.119, or 11.9% rate of return

✔CHECK YOUR UNDERSTANDING

C. Talibu Mbasa bought a house with a $25,000 down payment. He added a basement room and bath for $14,600. He spent $2,600 to paint the exterior and $2,300 to repair the plumbing. What is Talibu's capital investment in the house?

D. Ida Silvers purchased a cottage and lot for $85,000, paying $17,000 down and using a mortgage for the rest. The lot is estimated to be worth $5,000. She added a room by remodeling the attic for $12,600. She estimates that she will be able to rent the cottage for $1,200 a month. Her annual expenses will be $5,400, mortgage interest; 2.5% depreciation on the cottage and its capital improvements, and $4,800 other expenses. What is Ida's estimated return on her investment, to the nearest tenth percent?

Finding What Monthly Rent to Charge

To find the amount to charge for rent, first find the total annual expenses. Then find the amount you want to earn as net income on your investment. Add those two amounts and divide the sum by 12 to find the monthly rent to charge.

Annual Rental Income = Annual Net Income + Annual Expenses

Monthly Rent = Annual Rental Income ÷ 12

EXAMPLE 4

Ezra wants to earn 15% annual net income on his $10,000 cash investment in property. His annual expenses of owning the property are $2,700. What monthly rent must Ezra charge?

SOLUTION

Change the percent to a decimal and multiply by the cash investment.

15% × $10,000 = 0.15 × $10,000 = $1,500 desired annual net income

Add the desired annual net income and the annual expenses.

$1,500 + $2,700 = $4,200 annual rental income

Divide the annual rent income by 12. $4,200 ÷ 12 = $350 monthly rent

✔ CHECK YOUR UNDERSTANDING

E. Sid Weisbaum bought a vacant warehouse with a $24,000 down payment. He estimates that expenses will be $8,640 the first year. Sid wants to earn a rate of income of 8% on his investment. To do that, what monthly rent must he charge?

F. Ellie Burns wants to earn 15% annual net income on her $30,000 cash investment in a property. Her annual expenses of owning the property are $8,100. What monthly rent must Ellie charge?

Wrap Up ▶ ▶ ▶

One factor to consider is how the return on the rental property compares to the return on other investments they might make with the cash from the sale of the old house. The Canters might estimate their gross income using rents charged for similar properties in their neighborhood. They can subtract from that gross income the expenses they know they will have with the house and find the likely return on their investment. They should then compare their return on the house to returns on other investments, such as bonds, stocks, or mutual funds.

Communication

Visit or call a real estate agent to determine the typical return on investment percentages for rental housing in your area. Also, call a local bank to find the APR for a 3-year CD, and the APR for a savings account. Finally, call a local stockbroker to find the annual yield on a high quality corporate bond. Prepare a chart showing the various percentages you found.

Exercises

Perform indicated operation. Round to the nearest tenth, if needed.

1. $19 + $927 + $638

2. $842 + $72 + $604

3. $18,598 − $16,223

4. $8,450 ÷ $97,922

5. $362 − $53

6. $361 × 14

7. $187,526 × 1.8%

8. $422 ÷ $7,121

Find the annual net income for each real estate owner.

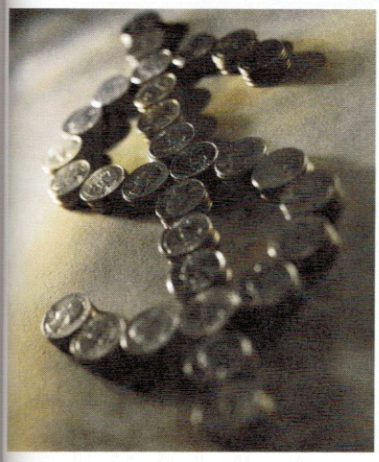
	Monthly Rent Income	Annual Expenses						Annual Net Income
		Taxes	Repairs	Insurance	Interest	Depreciation	Other	
9.	$420	$1,204	$329	$350	$1,470	$910	$35	
10.	$620	$1,900	$720	$760	$2,200	$1,120	$80	
11.	$420	$1,400	$105	$295	$1,500	$1,025	$45	
12.	$1,080	$3,260	$1,680	$720	$3,740	$2,400	$150	

Solve.

13. Marvin bought a house and lot for $72,000. He paid $18,000 cash and got a mortgage for the balance. He rented the house to a tenant for $950 a month. For the first year, Marvin's expenses were: mortgage interest, $4,800; 3% depreciation on the house valued at $58,000; and taxes, repairs, insurance, and other expenses, $3,750. What was his net income for the year?

14. Fatou Keita bought an eight-unit apartment building for $165,000. During the first year of ownership, she received $480 a month for the rent of each apartment unit. Her expenses for the year were: mortgage interest, $20,700; 2.5% depreciation on the building valued at $125,000; and taxes, repairs, insurance, and other expenses, $14,200. Find her net income for the year.

Find the rate of return, to the nearest tenth percent, on each cash investment. Show losses, or negative rates of return with a minus sign.



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	Annual Expenses				
	Cash Investment	Monthly Rental Income	Interest on Mortgage	Other	Rate of Income
15.	$23,000	$600	$2,800	$2,100	
16.	$35,000	$800	$1,800	$3,100	
17.	$41,000	$1,600	$10,200	$9,800	
18.	$13,000	$400	$2,100	$1,550	
19.	$33,000	$700	$2,500	$2,050	

Solve.

20. Mario Valente took out a $58,400 mortgage on a two-family house after making a down payment of $14,600. During the first year, he rented one unit at $550 a month and the other unit at $580 a month. For the year, he paid $5,800 in mortgage interest and $6,300 in other expenses. To the nearest tenth of a percent, what rate of income did Mario earn on his cash investment?

21. For $390,000, Bella Leipsen can buy an office building and lot that rents for $2,600 a month. Taxes, insurance, and repair expenses average $19,500 annually. Depreciation is estimated at $6,000 a year. Bella plans to pay $78,000 cash as a down payment. To the nearest tenth of a percent, find the rate of income she will make on her cash investment.

22. Bill Walsh made a $7,000 down payment on a condominium apartment that cost $35,000. He rented the condo at $510 monthly for the first year. During the year he had these expenses: taxes, $1,090; insurance, $370; interest, $2,400; repairs, $1,200; and depreciation, $700. What was Bill's rate of income on his cash investment, to the nearest tenth percent?

23. Marla Rios bought a six-unit apartment house for $140,000 and made a cash down payment of $40,000. The first year, she rented each of the 6 apartments at $500 a month. Her expenses for the year were: mortgage interest, $9,600; depreciation at 3% of the house's value of $110,000; and taxes, insurance, and other expenses, $12,600. Find Marla's rate of income on her cash investment, to the nearest tenth percent.

Marvin makes a down payment of $45,600 to buy a house. He also spends $14,000 to improve the property by adding a room and paving the driveway. Marvin estimates the total annual expenses of owning the house to be $16,200.

24. What would be Marvin's capital investment in the house?

25. What monthly rent will he have to charge in order to make a net income of 7% on his total capital investment?

Find the monthly rent the owner must charge.

	Cash Investment	Desired Annual Net Income	Annual Expenses	Monthly Rent
26.	$25,000	12% of investment	$3,900	
27.	18,000	8% of investment	2,990	
28.	35,000	11% of investment	9,430	
29.	46,000	7% of investment	8,600	

Bea Tompkins bought two lots for $16,000 at a tax sale. She estimates that her yearly expenses of owning these lots will be $740. A nearby factory wants to use the lots for parking trucks overnight. To earn a 12% rate of income on her investment:

30. What annual rent should Bea charge?

31. What monthly rent should Bea charge?

32. CRITICAL THINKING Assume you want to buy a small apartment building. What problems do you expect to have by being a landlord? Can you think of ways to prevent or solve those problems? Will you have to work full time at being a landlord? Based on your answers to these questions, what do you think are some of the advantages and disadvantages of investing in real estate?

33. FINANCIAL DECISION MAKING Which rate of return would you rather earn: 7% from a rental house or 7% from a bond? Explain your answer.

Mixed Review

34. Divide 96 by $\frac{3}{4}$.

35. Find 105% of 120.

36. Rewrite 4.5 as a percent.

37. 24 is what percent of 75?

38. Nellie O'Brien earns a salary of $1,500 a month plus 5% commission on all sales. Last month her sales were $40,000. What was her gross income for the month?

39. Zed Hargrove cashed in a $1,200 time-certificate account that paid 7% annual interest. Because he withdrew his money before the end of the term, the bank charged a penalty of 2 months' interest. What was the amount of the penalty?

7-9

Retirement Investments

GOALS

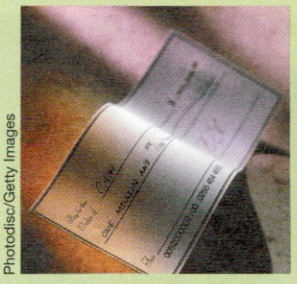
- Calculate your retirement income
- Calculate your pension income
- Calculate the required minimum payout from a pension fund
- Calculate the penalty for early withdrawal from an individual retirement account

KEY TERM

- individual retirement account (IRA)

Start Up ▶▶▶

Some working people do not save money for retirement, counting on their Social Security benefits to provide their retirement income. Is this a wise plan?



Photodisc/Getty Images

Math Skill Builder

Review these math skills and solve the exercises that follow.

1 **Subtract** dollar amounts.
Find the difference. $4,290 − $2,978 = $1,312

1a. $5,398 − $3,148

1b. $11,408.23 − $8,971.93

2 **Multiply** percents by whole numbers and dollar amounts.
Find the product. 2.4% × 40 = 0.024 × 40 = 0.96
Find the product. 96% × $75,000 = 0.96 × $75,000 = $72,000

2a. 1.7% × 30

2b. 2.3% × 40

2c. $84,500 × 82.4%

2d. $49,300 × 75.9%

3 **Divide** dollar amounts by decimals and dollar amounts.
Find the quotient. $360,000 ÷ 21.8 = $16,513.76
Find the quotient to the nearest tenth percent. $5,500 ÷ $420,000 = 1.3%

3a. $459,600 ÷ 18.4

3b. $277,500 ÷ 12.7

3c. Divide $3,670 by $248,900 to the nearest tenth percent.

Retirement Income

You may receive retirement income from several sources: Social Security benefits, your own pension plan, a company, union, or organization pension plan, and income from other investments.

The income taxes on the amount you invest and the income your investment earns may be deferred until you retire, depending on the type of investment. This allows your retirement funds to grow much faster.

For example, one type of retirement investment is the **individual retirement account**, or IRA. There are many types of IRAs. The traditional IRA allows individuals earning less than a certain annual amount to invest up to $5,000 plus a cost-of-living adjustment each year. The tax on the money invested and any earnings may be deferred until you retire. When you retire, the money you withdraw from your IRA will be taxed at the current tax rate.

Advantage of Tax Deferred Investments		
Years	Nontaxed Investment	Investment Taxed at 20%
5	$28,187	$22,016
10	$65,906	$49,846
15	$116,382	$85,028
20	$183,931	$129,505
25	$274,327	$185,731
30	$395,297	$256,810
35	$557,182	$346,667
40	$773,820	$460,261

Business *Tip*

The maximum amount a person under 50 can contribute to an IRA is $5,000 plus a cost-of-living adjustment, which adjusts for inflation.

Business *Tip*

Taxpayers earning less than a certain amount a year may deduct from taxable income up to $5,000 plus a cost-of-living adjustment by investing in a traditional IRA. The amount of investment that can be deducted is phased out as annual income rises.

The table shows the results of investing $5,000 each year from 5 to 40 years. The chart assumes that a $5,000 investment is made at the beginning of each year and that the investment grows at 6% a year. Notice that if you invest in a tax deferred IRA, your total investment would grow to $773,820 in 40 years. If you place your money in a taxable investment, your balance would only be $460,261. Your money would have grown 68% more by being in a tax deferred IRA instead of an investment taxed yearly!

EXAMPLE 1

Sam Weisbrunner is retiring at age 65. At age 65, his company pension will pay him $1,560 a month and social security will pay him $800 a month. He has $120,000 in an IRA fund. What percent, to the nearest tenth, of the fund must Sam withdraw each month to raise his monthly retirement income to $3,600?

SOLUTION

Add the monthly company pension and social security.

$\$1{,}560 + \$800 = \$2{,}360$ retirement income

Subtract the non-IRA income from the desired monthly income.

$\$3{,}600 - \$2{,}360 = \$1{,}240$ amount needed from IRA

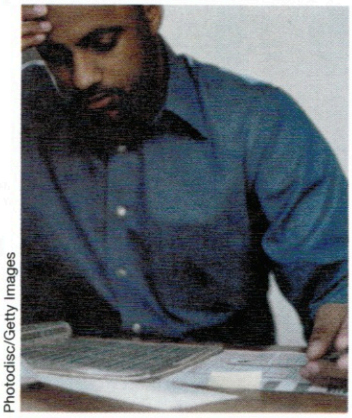
Divide the amount needed from the IRA by the amount of the IRA fund.

$\$1{,}240 \div \$120{,}000 = 0.0103$, or 1.0% percent to withdraw each month

✔ CHECK YOUR UNDERSTANDING

A. Jane Eiler will receive \$1,620 in pension and \$900 from social security each month when she retires at age 65. She wants her monthly retirement income to be \$4,000. What percent, to the nearest tenth percent, of her \$350,000 IRA must she withdraw monthly to reach the monthly income she wants?

B. Abner Duncan started investing \$5,000 in an IRA when he was 30. The account has earned a steady 6% growth each year. Find how much money Abner has in his IRA at age 60.



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Pension Income

There are two basic types of pension funds: *defined contribution plans* and *defined benefit plans.* Under defined contribution plans, you, your employer, or both contribute to your pension fund, often a percent of your annual wages. The amount you receive depends on how well the investments in your plan do over the years.

A defined benefit plan pays you a specific amount on retirement. The amount you receive from your pension fund usually depends on a number of factors, including how old you are when you retire, how many years you contribute to that pension plan, and how much money you put in the pension fund over the years.

You may be penalized by retiring early. For example, you may receive a reduced benefit for retiring before age 65 or 67. You may also have to contribute for a minimum number of years to a pension plan to collect any money. You may also be given a choice of how much money you can put into the fund each year.

EXAMPLE 2

John Baker's pension fund will pay him a pension rate of 2.2% of his average salary for the last four years for each year of service with his organization. If John plans to retire after 30 years of service, what percent of his final salary will he receive? If his final average salary is \$56,000, what annual amount will he receive?

SOLUTION

Multiply the yearly pension rate by the number of years of service.

$2.2\% \times 30 = 66\%$ total pension rate

Multiply the total pension rate by the final average salary.

$66\% \times \$56{,}000 = 0.66 \times \$56{,}000 = \$36{,}960$ amount of pension

✔ CHECK YOUR UNDERSTANDING

C. Keisha Turner is retiring after 30 years with her firm. Her pension fund pays 1.9% of her average salary for the last four years for each year of service. Her annual salary for the last four years was $71,000, $74,000, $75,000, and $77,000. What is her average salary for the last four years? What is the total pension rate? What monthly pension amount will she receive?

D. Juan Vellano's union pension fund provides for $5 a month at age 65 for each $130 he has contributed. When Juan retired at age 65, he had contributed $96,000 to the fund. What is his monthly pension amount?

Withdrawals from a Retirement Investment

With few exceptions, you can't withdraw funds from a traditional IRA before you reach age $59\frac{1}{2}$. If you do, you will pay a 10% penalty on the amount you withdraw. You will also have to pay federal and state income taxes on the withdrawal.

A person who has a private pension fund, such as an IRA, must withdraw a minimum amount each year from the fund when that person reaches $70\frac{1}{2}$. The minimum amount of the withdrawal required by law depends on the age of the person withdrawing funds and is found using the chart shown below. To use the chart, find your age at retirement. Then divide the divisor for that age into the total value of your IRA. The result is the required minimum you must withdraw each year.

Age	Divisor	Age	Divisor
70	27.4	78	20.3
71	26.5	79	19.5
72	25.6	80	18.7
73	24.7	81	17.9
74	23.8	82	17.1
75	22.9	83	16.3
76	22.0	84	15.5
77	21.2	85	14.8

Business *Tip*

Some exceptions to the early IRA withdrawal penalty are if the money is used for a first-time home purchase, higher education, health insurance premium, certain medical expenses, or if you become disabled. The money withdrawn will still be subject to federal and state income taxes.

EXAMPLE 3

Lu-yin Huang's IRA balance is $428,000 at age 75. What amount must she withdraw from her IRA during the year?

SOLUTION

Divide the IRA balance by the divisor in the table for age 75.

$\$428{,}000 \div 22.9 = \$18{,}689.96$ minimum amount to be withdrawn

EXAMPLE 4

Tito Carlocci withdrew \$3,000 from his IRA at age 41. What penalty did he pay?

SOLUTION

Multiply the amount withdrawn before the age of $59\frac{1}{2}$ by 10%.

$\$3{,}000 \times 10\% = \$3{,}000 \times 0.10 = \$300$ amount of penalty

✔ CHECK YOUR UNDERSTANDING

E. Prasam Shinawatra is 72 and his IRA investment totals \$396,100. What minimum amount must he withdraw this year?

F. Karl Schmidt withdrew \$12,500 from his IRA at age 46. What penalty did Karl pay?

Wrap Up ▶ ▶ ▶

The Social Security Act provides only *supplemental* retirement benefits and should not be counted on to pay enough for a person to live on in retirement. It is important that you save money in a retirement account or pension plan other than social security if you wish to have enough money to retire.

Exercises

Solve.

1. Eileen Rustio started investing \$5,000 in an IRA when she was 40. The account has earned a steady 6% growth each year. Use the table in the lesson to find how much money Eileen has in her IRA at age 65.
2. Use the table in the lesson to find, to the nearest whole percent, by how much the nontaxed investment amount is greater than the investment taxed at 20% after 30 years.
3. Rod Schweiger receives \$1,150 in monthly pension and \$650 monthly from social security at retirement. He wants his monthly retirement income to be \$3,000 a month. What percent of his \$275,000 IRA must he withdraw monthly to reach the monthly income he wants?
4. Salvador Nuncio's monthly retirement income is made up of \$1,900 from his employer-based pension fund and \$900 from social security. He also has an IRA worth \$150,000. What percent of his IRA must he withdraw if he wants his total retirement income to be \$42,600 a year?
5. Tony Conte is retiring after 40 years of work at age 65. He will receive the following monthly amounts: \$1,400 from his union pension and \$840 from social security. What is his annual retirement income?

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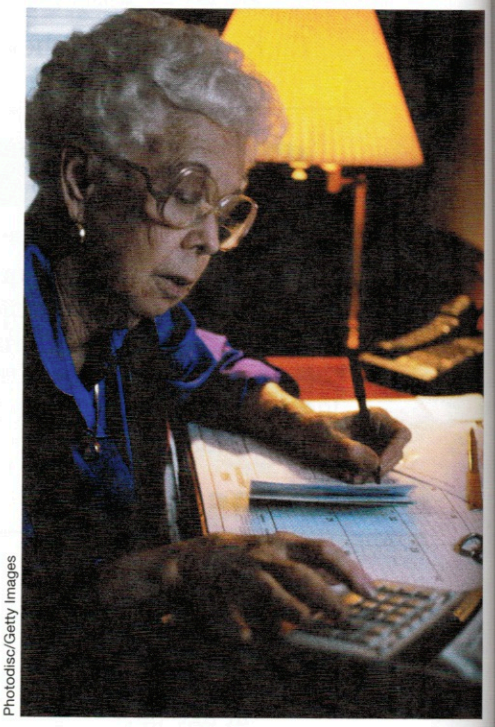
Kelly O'Malley's pension fund pays 2.1% of her average salary for the last three years for each year of service. Her annual salary for the last three years was $87,000, $90,000, and $95,000. Kelly has contributed to her pension fund for 25 years.

6. What is her average salary for the last three years?
7. What is Kelly's total pension rate?
8. What monthly pension amount will she receive if she retires this year?

Pablo Gonzales contributed $48,000 to his pension fund over 20 years of service to his company. The fund pays $4 a month for each $100 of pension funds contributed if he retires at age 65.

9. What is his monthly pension amount at age 65?
10. **STRETCHING YOUR SKILLS** How many months will it take Pablo to recover the amount of his contributions?


Photodisc/Getty Images

Solve.

11. Peter True's pension fund reduces the total pension rate he is to receive by $\frac{1}{2}\%$ for each year that he retires before the age of 67. If Peter retires at age 62, by what percent will he be penalized?
12. Marla Pezweski is age 82 and has a $1,289,350 IRA. What amount must she withdraw, as a minimum, from her IRA this year?
13. Jake Reilly has a total of $529,200 in his IRA. If Jake is 76, what minimum amount must he withdraw from his IRA this year?
14. Amoni Rahum is age 78. Her IRA investment is $738,300. What minimum amount must she withdraw this year?
15. Rich Vanegan withdraws $4,350 from his IRA when he is only 35. What penalty must he pay?
16. **FINANCIAL DECISION MAKING** Bea Roche is 48 years old. She wants to withdraw $5,125 from her IRA for a period of one year. Her friend suggests that she borrow the money from the cash value of her life insurance company. The loan would be at a rate of 7.5%. Which plan will cost Bea less?

Mixed Review

17. Divide 569 by 16 to the nearest tenth.
18. Divide 104.68 by 4.5 to the nearest hundredth.
19. Tomas Mendosa borrowed $250 for 30 days on his credit card using a cash advance. His card company charged a cash advance fee of $25 and a daily periodic interest rate of 0.0514%. What was the total finance charge on the cash advance?

Chapter Review

Vocabulary Review

Find the term, from the list at the right, that completes each sentence. Use each term only once.

bonds
capital investment
cash value
coinsurance
current yield on bonds
disability insurance
discount
health insurance
individual retirement account (IRA)
life insurance
major medical insurance
market price
mutual fund
net asset value
premium

1. If you cannot work due to a health condition or an injury, ___?___ pays a portion of the income you lose.
2. ___?___ protects your family against financial loss due to your death.
3. ___?___ helps pay for hospital, surgical, medical, or other health care expenses due to a major illness or an injury.
4. ___?___ provides basic protection against financial loss from medical bills.
5. The money you get if you cancel a life insurance policy is called ___?___.
6. ___?___ are a form of long-term promissory note.
7. Annual interest income divided by a bond's price is called ___?___.
8. The price at which a stock sells is called the ___?___.
9. ___?___ companies use money from investors to buy stock in many companies.
10. The price at which mutual fund shares are traded is called ___?___.
11. The amount of cash you originally invest plus what you spend for improvements in real estate is called a(n) ___?___.
12. A popular form of retirement investment is called ___?___.
13. When the market value of a bond is more than its par value, the bond is selling at a(n) ___?___.
14. When the market value of a bond is less than its par value, the bond is selling at a(n) ___?___.
15. After the deductible is met, the ___?___ is the amount of money that the insured must pay out of his or her own pocket for health care services.

7-1 Life Insurance

16. Bob Walzcek bought a $135,000 term life insurance policy. He paid an annual premium of $1.65 per $1,000 of insurance. What annual premium did he pay?
17. Ava Leland pays $145.80 quarterly for a whole life insurance policy. This year, her policy paid a dividend of $43.71. Find her annual premium and the net cost of her policy for the year.
18. Using the cash value table, how much can you borrow against a 15-year policy with a face value of $100,000?
19. Using the cash value table, how much would you receive if you cancelled a 10-year policy with a face value of $50,000?

7-2 Health Insurance

20. Alan Lester's employer pays 60% of his annual health insurance premium. If the total monthly premium for the insurance is $86, what is Alan's share of the annual premium?

21. Louisa Corita's total medical bill was $3,989. Only $3,583 was covered by her group medical insurance policy. Louisa's coinsurance for the bill was 21%, and her remaining annual deductible was $300. What amount of the medical bill must Louisa pay?

22. Trisha Longworth has to pay 35% of her family's monthly health insurance premium. Her employer pays the rest of the $419 monthly premium. What is the annual amount that Trisha's employer pays for health insurance for Trisha and her family?

7-3 Disability Insurance

23. Boris Raskonov is totally disabled. His group disability policy's benefit percentage is 60% of his average annual salary for the last 3 years. His annual salary for the last 3 years was $55,300; $58,600, and $59,700. What monthly disability benefit amount will he receive?

24. Emma Abbot has a debilitating disease that has left her able to work. Her disability policy's benefit is 55% of her average annual salary for the last 5 years. Her annual salaries were $48,450; $51,300; $52,875; $52,875, and $55,090. What benefit amount will she receive each month?

7-4 Bonds

25. Tenco Foundry $1,000 bonds are quoted at 101.379. What is their market price?

26. Tessalee Lightner bought 10, $1,000 Montgomery County bonds at 102.682. The broker charged $3 per bond commission. What total investment did Tessalee make in the bonds?

27. Alltown School Bonds are selling at 98.54. What is the price of one of the school's $1,000 bonds? Are the bonds selling at a discount or a premium?

7-5 Bond Interest

28. Victor Armound bought 50, $1,000, 7.5% bonds. What is his annual income from the bonds?

29. Tara Sebring owns 100, $1,000, 8.25% bonds. How much does she earn semiannually from the bonds?

30. The semiannual interest on Laclede Airport $1,000 bonds is $62.50. If you buy the bonds at 98.487, what is the current yield, to the nearest tenth percent?

31. Vaughnie Kinder buys 20, $1,000, 9.4% bonds through a dealer at 102.775 plus accrued interest of $23.50 per bond and commission of $4 per bond. What is the total cost of the bonds to Vaughnie?

32. Timothy O'Hane buys 10, $1,000, 7% bonds on April 1 at 101.528 plus accrued interest from January 1. Commission was not shown. What is Timothy's total cost for each bond?

7-6 Stocks

33. A broker sold Octavia Relenza 200 shares of stock at $23.19. Octavia's broker charged $199.13 commission. Find the total cost of the stock to Octavia.

34. Reality Films common stock pays a quarterly dividend of $3.50 per share. If Vincente Guillermo owns 500 shares of the stock, what amount will he receive in dividends for the year?

35. Diane Limbaugh bought 100 shares of stock at $10.78. Her broker charged her $47.30 commission. If the stock pays a quarterly dividend of $0.14, what is its annual yield, to the nearest tenth percent?

36. Pedro Lamas bought 200 shares of common stock at $31.50 and was charged a commission of $134. He later sold the same stock for $38.20. The commission and fees on the sale were $143. What was Pedro's profit or loss?

7-7 Mutual Funds

37. Hisako Matsunaga purchased 400 shares of a no-load fund at its NAV of $11.73. She also purchased 300 shares of a load fund at its offer price of $23.77. What was her total investment in the funds?

38. A mutual fund has a NAV of $6.94 and an offer price of $7.22. What is the rate of commission, to the nearest tenth percent?

39. You redeemed 300 shares of a mutual fund at its NAV of $14.72. Your total investment in the shares was $3,910.10. What was your profit or loss on the sale?

7-8 Real Estate

40. Zebulon Poke bought a house and the lot it is on for $250,000. During the first year, he received $2,150 a month in rent. His expenses for the year were: mortgage interest, $12,800; 2% depreciation on the building valued at $200,000; and taxes, repairs, insurance, and other expenses, $5,500. Find his net income or loss for the year.

41. Bineka Zaheer bought a house with a $20,000 down payment. She also added a carport for $4,600. She estimates that she will be able to rent the house for $1,000 a month and that her first-year expenses will be mortgage interest, $5,600; taxes, $896; depreciation, $1,450; and other expenses, $1,288. What is Bineka's estimated return on her investment, to the nearest tenth percent?

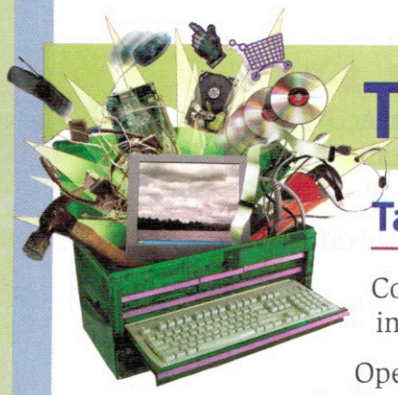
42. Ollie Breem wants to earn 10% annual net income on his $25,000 cash investment in a property. His annual expenses of owning the property are $8,100. What monthly rent must Ollie charge?

7-9 Retirement Investments

43. Jeanne Wilder is retired and receives $1,870 in monthly pension and $1,100 monthly from social security. She wants her monthly retirement income to be $4,500. What percent, to the nearest tenth, of her $250,000 IRA must she withdraw monthly to reach the monthly income she wants?

44. Keiko Yoshino is retiring after 30 years with her firm. Her pension fund pays 2% of her average salary for the last three years for each year of service. Her annual salary for the last three years was $57,400, $59,200, and $61,600. What is her average salary for the last three years? What is the total pension rate? What monthly pension amount will she receive?

45. Karl Lamour withdrew $22,000 from his IRA at age 49. What penalty did he pay?



Technology Workshop

Task 1 Enter Data in an IRA Calculator Template

Complete a template that estimates the future value of investments you make in an IRA.

Open the spreadsheet for Chapter 7 (tech7-1.xls) and enter the data shown in the blue cells (cells B3 through B5). Your computer screen should look like the one shown below when you are done.

	A	B
1	**IRA Calculator**	
2		
3	Estimated Annual Growth Rate	8.0%
4	Annual Investment	$5,000
5	Number of Years	40
6		
7	Future Value	$1,295,304.32

The spreadsheet calculates the value of your investments in the future. For example, suppose that you invest $5,000 each year for 40 years starting at age 25. Suppose also that you estimate that the annual earnings of your investment will be 8%. The spreadsheet calculates that the *future value* of your IRA at the end of 40 years will be $1,295,304.32.

Calculating the future value of investments is no different than calculating compound interest when deposits are made at the end of each year. Spreadsheets make these laborious calculations quick and easy to do.

Task 2 Analyze the Spreadsheet Output

It is important to recognize that you must contribute as early as possible to have a large IRA balance when you retire. Small amounts invested over long periods of time are equal to much larger amounts invested over short periods of time. Unfortunately, some people wait until they are in their forties to save for retirement. Enter 20 years in cell B5 to show what the future value of the IRA would be if a person started saving at age 45.

Answer the following questions.

1. What is the future value of the 20-year IRA?
2. Estimate the difference in the balances between the 20-year and 40-year contributions.
3. What is the exact difference in the balances?
4. Keep raising the annual investment amount until you get close to the future value, $1,295,304 shown in the original spreadsheet. What approximate annual amount must be contributed to some type of retirement investment starting at age 45 to reach the same value (about $1,295,000) as a $5,000 annual investment started at age 20?

5. What spreadsheet function is used in cell B7?
6. Re-enter 40 years in cell B5 and $5,000 in cell B4. What would be the future value of the contributions if the estimated growth rate was 10% instead of 8%?

Task 3 Design a Major Medical Coverage Spreadsheet

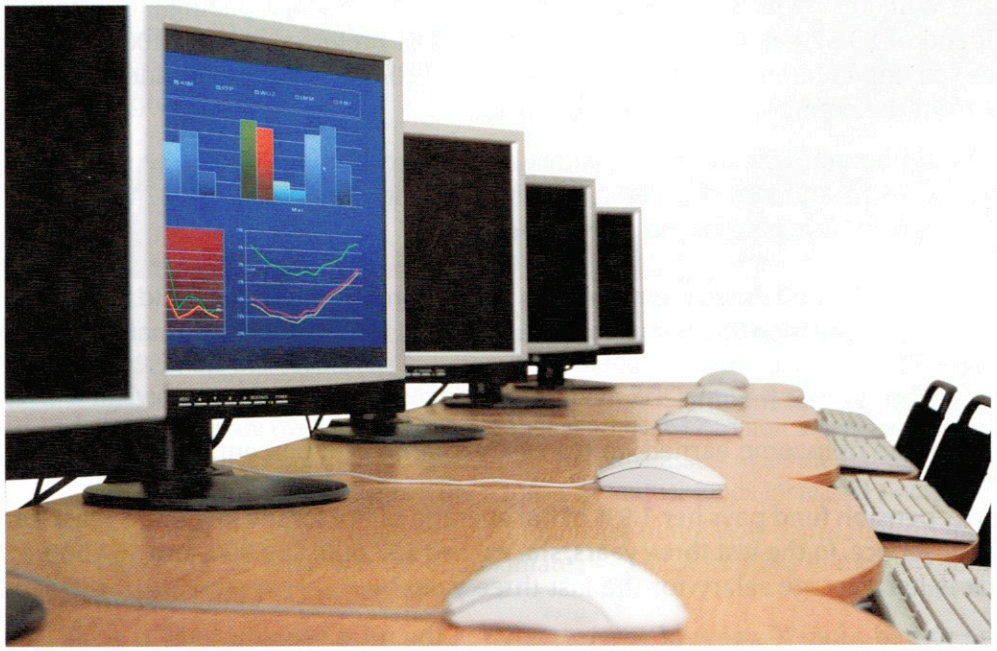
You are to design a spreadsheet that will calculate the amount of medical expenses paid by the insurer and the amount paid by the insured for a major medical insurance policy.

SITUATION: You work in the personnel office of a small company that provides major medical insurance for its employees. The major medical policy pays 85% of all bills after a $1,000 deductible is paid. An employee has $50,000 in major medical expenses after a serious accident.

Task 4 Analyze the Spreadsheet Output

Answer these questions about your completed spreadsheet.

7. How much of the employee's major medical expenses does the insurance company pay?
8. How much does the employee pay?
9. What formula did you use to find the amount that the insurance company paid?
10. What formula did you use to calculate the employee share?
11. Suppose an employee had major medical expenses of $25,500. How much of the employee's major medical expenses does the insurance company pay?
12. How much does the employee pay?



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Chapter Assessment

Chapter Test

Answer each question.

1. $\$235{,}000 \div \$1{,}000$
2. $26 \times \$38.89$
3. $125\% \times \$78$
4. $80\% \times \$1{,}600$
5. $\$1{,}354 - \$600$
6. $1{,}050 \times \$0.49$
7. $\frac{1}{4} \times \$42{,}100$
8. $\$37 + \$28 + \$376 + \$73$

Solve.

9. Pamela Hopkins has a life insurance policy for $15,000. She pays a premium rate of $23.48 per $1,000 annually. This year the insurance company paid a dividend of $33.60. What is Pamela's premium for the year after deducting the dividend?
10. Tia's major medical policy has a $1,000 deductible feature and a 15% coinsurance feature. Last month she spent $10,300 for medical expenses, $700 of which were not covered under her policy. How much did Tia pay?
11. Tito Tortelli becomes totally disabled. His group disability policy's benefit percentage is 60% of his average annual salary for the last 3 years. His annual salaries were $35,800; $38,500; and $39,800. What monthly benefit amount will he receive?
12. Find the yield, to the nearest tenth percent, on a $1,000, 11.5% bond bought at 106.
13. Park Lee bought 300 shares of stock at 26.45, plus commission of $182.50. What was the total cost of the purchase?
14. Jolene Williams owns 800 shares of TRI, Inc. common stock paying a quarterly dividend of $0.57 per share and 400 shares of TRI preferred stock, $100 par value, paying an annual dividend of 7.2%. Find the total annual dividend she gets from the common and preferred stock.
15. Bev Jorald bought 500 shares of a stock at a total cost of $12,762. She sold the shares at 40.76 and was charged a commission and other costs of $374. What was her profit or loss from the sale of the stock?

Ted Ling made a $37,000 down payment on a resort condominium that sold for $185,000. His average monthly rental income will be $1,850. His total annual expenses will be $18,800.

16. Find his annual net income.
17. Find his rate of income earned, to the nearest tenth of a percent.

Laura Barn's pension fund pays her 1.9% of her average salary for the last three years for each year of service. In the last three years, she earned $57,000, $59,800, and $62,500.

18. What is her average salary for the last three years?
19. If she retired after 30 years of service, what is the total pension rate?
20. What monthly pension amount will she receive?

Planning a Career in Health Sciences

Many jobs in health sciences are directly in patient care, like nurses, radiology technicians, physicians, and phlebotomists. Other opportunities include areas of medical records, pharmaceuticals, laboratory work, biochemical engineering, and emergency medicine. Workers in the health sciences can be found in hospitals, universities, private offices, laboratories, industrial settings, schools, and retail markets. If you are detail oriented, have good communication skills, and work well under pressure, health sciences may right for you.

Job Titles

- Physician
- Sonographer
- Optometrist
- Nurse
- Lab technician
- Medical records technician
- Pharmacist

Needed Skills

- good communication skills
- excellent problem solving and deduction skills
- strong mathematical and scientific background
- ability to use technology
- outstanding leadership skills
- ability to work independently, as well as with others

What's it Like to Work in Medical Records

As a medical records technician, for every doctor's appointment, medical test, or treatment that a person receives, a record is generated. Personal information, medical history, current symptoms, and treatment plans must all be documented accurately to ensure that complete information is available when medical personnel or insurance companies access a record. One critical component of the job of health information technicians is the coding of medical information that is required for insurance purposes. Accuracy of all records and coding is of utmost importance.

What About You?

Does dealing with patients or medical tests and record appeal to you? What field in health sciences might you be most interested?

How Times Have Changed

For Questions 1–2, refer to the timeline on page 271 as needed.

1. In 1925, the Massachusetts Investors Trust mutual fund had $392,000 in assets and about 200 individual investors. By 1969, there were about 270 mutual funds with $48 billion in assets. Today there are over 10,000 mutual funds with over $7 trillion assets and about 83 million individual investors. By what percentage have the assets of all mutual funds increased since 1969? By what percentage has the number of mutual funds increased since 1969?
2. What was the approximate percent of increase in the Dow Jones Industrial Average from 1906 to 1972? What was the approximate percent of increase in the Dow Jones Industrial Average from 1972 to 2007?