

1-1**Lesson Reading Guide*****A Plan for Problem Solving*****Get Ready for the Lesson**

Complete the Mini Lab at the top of page 24 in your textbook.

Write your answers below.

1. How many white tiles does it take to border each of these three gardens?
2. Predict how many white tiles it will take to border the next-largest garden. Check your answer by modeling the garden.
3. How many tiles will it take to border a garden that is 6 tiles long?
Explain your reasoning.

Read the Lesson

4. Read the Check section in Example 1 at the bottom of page 25. In the equation $8 + 18 = 26$, what does the 8 stand for? What does the 18 stand for?
5. Look at the Explore section in Example 2 on page 26. What does the word “difference” mean? Now read the Plan section. Explain how to find the distance traveled in 1 minute when you know the distance per second.
6. Look at the graph in Example 2 on page 26. Explain how the animals in the chart are listed. Why is the cheetah first?

Remember What You Learned

7. *Early problem solvers care* is a mnemonic aid to remember the first letters of the steps in the problem-solving plan. Write a mnemonic aid of your own using the first letters of the steps.

1-2**Lesson Reading Guide*****Variables, Expressions, and Properties*****Get Ready for the Lesson**

Complete the Mini Lab at the top of page 29 in your textbook.

Write your answers below.

1. Complete the table below.

Figure Number	1	2	3	4	5	6
Perimeter	4	8				

What is the relationship between the figure number and the perimeter of the figure?

2. What would be the perimeter of Figure 10?

Read the Lesson

3. Number the operations in the correct order for simplifying $2 + 4(9 - 6 \div 3)$. Then simplify the expression.

___ Addition

___ Multiplication

___ Subtraction

___ Division

For Exercises 4–8, describe how each pair of numerical expressions is different. Then determine whether the two expressions are equal to each other. If the expressions are equal, name the property that says they are equal.

4. $2 + 5, 5 + 2$

5. $(6 - 4) - 1, 6 - (4 - 1)$

6. $2(5 - 3), 2 \cdot 5 - 2 \cdot 3$

7. $5 \cdot (4 \cdot 7), (5 \cdot 4) \cdot 7$

8. $10 \div 2, 2 \div 10$

Remember What You Learned

9. The word *counter* has several meanings in the English language. Use a dictionary to find the meaning of *counter* when it is used as a prefix in the word *counterexample*. Then write your own definition of *counterexample*.

1-3**Lesson Reading Guide*****Integers and Absolute Value*****Get Ready for the Lesson**

Read the introduction at the top of page 35 in your textbook.

Write your answers below.

1. What does an elevation of -86 meters represent?
2. What does a temperature of -35° represent?

Read the Lesson

The symbol ... is called an ellipsis.

3. Look on page 35 in your textbook to find the meaning of the ellipsis as it is used in the list 1, 4, 7, 10,
4. Use a dictionary to find the meaning of the ellipsis as it is used in the sentence *The marathon began...downtown.*
5. How can you explain the usage of the ellipsis in the list in Exercise 3 in terms of the meaning for the ellipsis in the sentence in Exercise 4?
6. Look at the number line on page 35 of your textbook. How are the ellipses (plural of ellipsis) in the set of integers $\{\dots, -4, -3, -2, -1, 0, 1, 2, 3, 4, \dots\}$ represented on the number line?

Complete each sentence with either *left* or *right* to make a true sentence. Then write a statement comparing the two numbers with either $<$ or $>$.

7. -45 lies to the _____ of 0 on a number line.
8. 72 lies to the _____ of 0 on a number line.
9. -3 lies to the _____ of -95 on a number line.
10. 6 lies to the _____ of -7 on a number line.
11. Describe the symbol for the absolute value of 3. Then write the symbol.

Remember What You Learned

12. Write a mathematical expression that represents the following sentence. (*Hint: Let f represent the 49ers' score and s represent the Seahawks' score.*)

The Seahawks and the 49ers scored within 3 points of each other.

1-4**Lesson Reading Guide*****Adding Integers*****Get Ready for the Lesson**

Read the introduction at the top of page 41 in your textbook.

Write your answers below.

1. Write an integer that describes the game show host's statement.
2. Write an addition sentence that describes this situation.

Read the Lesson

3. Look at your answer for Exercise 2. Identify each number in the addition sentence as either an addend or a sum.

Identify the number with the greater absolute value.

- | | |
|-----------|-------------|
| 4. 4, 8 | 5. -3, 5 |
| 6. 9, -12 | 7. -23, -16 |

Determine whether you *add* or *subtract* the absolute values of the numbers to find the sum. Give a reason for your answer.

- | | |
|-----------------|-------------------|
| 8. $4 + 8$ | 9. $-3 + 5$ |
| 10. $9 + (-12)$ | 11. $-23 + (-16)$ |

Determine whether the sum is *positive* or *negative*. Then find the sum.

- | | |
|-----------------|-------------------|
| 12. $4 + 8$ | 13. $-3 + 5$ |
| 14. $9 + (-12)$ | 15. $-23 + (-16)$ |

Add.

- | | | | |
|-------------------|-------------------|-------------------|-------------------|
| 16. $3 + (-4)$ | 17. $-3 + 4$ | 18. $-6 + (-4)$ | 19. $7 + 8$ |
| 20. $25 + (-17)$ | 21. $-34 + (-17)$ | 22. $-43 + 4$ | 23. $11 + (-30)$ |
| 24. $-81 + (-63)$ | 25. $-39 + 124$ | 26. $97 + (-165)$ | 27. $-49 + (-75)$ |

Remember What You Learned

28. You have seen what a negative number means in terms of weather or money. Describe what a negative number means on a video cassette recorder.

1-5**Lesson Reading Guide*****Subtracting Integers*****Get Ready for the Lesson**

Complete the Mini Lab at the top of page 46 in your textbook.

Write your answers below.

- How does this result compare with the result of $3 + (-5)$?
- Use algebra tiles to find $-4 - 2$.
- How does this result compare to $-4 + (-2)$?
- Use algebra tiles to find each difference and sum. Compare the results in each group.
 - $1 - 5$; $1 + (-5)$
 - $-6 - 4$; $-6 + (-4)$

Read the Lesson

- Find the opposite of 7.
- Find the additive inverse of 7.
- How is the opposite of a number different from the additive inverse of the number?

Rewrite each difference as a sum. Then find the sum.

8. $2 - 9$

9. $-3 - 8$

10. $10 - (-12)$

11. $-5 - (-16)$

Subtract.

12. $3 - (-5)$

13. $-3 - 5$

14. $-7 - (-3)$

15. $6 - 8$

16. $23 - (-17)$

17. $-24 - (-12)$

18. $-41 - 4$

19. $31 - (-26)$

20. $-81 - (-33)$

21. $-139 - 134$

22. $97 - (-265)$

23. $-59 - (-77)$

- Describe the method for subtracting integers.

Remember What You Learned

- Subtraction and addition are often referred to as opposite operations. Explain in your own words the relationship between addition and subtraction.

1-6**Lesson Reading Guide*****Multiplying and Dividing Integers*****Get Ready for the Lesson**

Read the introduction at the top of page 51 in your textbook.

Write your answers below.

1. Write two different addition sentences that could be used to find the submersible's depth after 3 minutes. Then find their sums.
2. Write a multiplication sentence that could be used to find this same depth. Explain your reasoning.
3. Write a multiplication sentence that could be used to find the submersible's depth after 10 minutes. Then find the product.

Read the Lesson

4. Identify each number in the multiplication sentence $3(-120) = -360$ as either a factor or a product.

Complete each sentence with either *positive* or *negative*.

5. The product of two integers with different signs is _____ .
6. The product of two integers with the same signs is _____ .
7. The quotient of two integers with different signs is _____ .
8. The quotient of two integers with the same signs is _____ .

Determine whether each product or quotient is *positive* or *negative*. Then evaluate the expression.

- | | |
|--------------------|---------------------|
| 9. $4 \cdot 8$ | 10. $-3 \cdot 5$ |
| 11. $9(-2)$ | 12. $-6(-7)$ |
| 13. $12 \div (-4)$ | 14. $-35 \div (-7)$ |
| 15. $\frac{21}{3}$ | 16. $\frac{-64}{8}$ |

Remember What You Learned

17. Explain how to find the mean of a set of numbers. What is another name for the mean?

1-7**Lesson Reading Guide*****Writing Equations*****Get Ready for the Lesson**

Read the introduction at the top of page 57 in your textbook.

Write your answers below.

1. What is the relationship between the number of guests and the cost of the party?
2. Write an expression representing the cost of a party with g guests.
3. What does the equation $g \cdot 8 = 120$ represent in this situation?

Read the Lesson

Look at the steps for writing an algebraic equation on page 57. Then determine whether each situation requires *addition*, *subtraction*, *multiplication*, or *division*.

4. Find the difference between the cost of a gallon of premium gasoline and the cost of a gallon of regular gasoline.
5. Find the cost per person when the price of a pizza is split among several people.
6. Find the price of an airline ticket after the price has been decreased by \$50.
7. Find how much an executive spent on breakfast, lunch, and dinner.
8. Find the flight time after the time has been increased by 15 minutes.
9. Find the product of the price of a calculator and the number of students in the class.
10. Find the high temperature on Wednesday if this temperature is 3° less than the high temperature on Tuesday.
11. Find the ratio of the amount of gasoline used and the distance traveled.

Remember What You Learned

12. Devise your own way to determine how a verbal description should be translated as an algebraic equation.

1-9**Lesson Reading Guide*****Solving Addition and Subtraction Equations*****Get Ready for the Lesson**

Complete the Mini Lab at the top of page 65 in your textbook.

Write your answers below.

Solve each equation using algebra tiles.

1. $x + 1 = 4$

2. $x + 3 = 7$

3. $x + (-4) = -5$

4. Explain how you would find a value of x that makes $x + (-3) = -8$ true without using models.

Read the Lesson

5. Match the method of solving with the appropriate equation.

$x + 6 = 9$ _____

a. Subtract 11 from each side.

$s - 5 = 14$ _____

b. Subtract 6 from each side.

$4 = -3 + p$ _____

c. Add 3 to each side.

$11 + m = 33$ _____

d. Add 5 to each side.

For Exercises 6–8, explain how to solve each equation.

6. $w - 7 = -2$ _____

7. $c + 3 = 9$ _____

8. $17 = 11 + k$ _____

Solve each equation.

9. $z + 8 = 2$

10. $3 = -7 + r$

11. $-9 = g - 14$

Remember What You Learned

12. Write two addition and two subtraction equations of your own. Trade your equations with a partner and solve. Explain to each other the method you used to solve the equations.

1-10**Lesson Reading Guide*****Solving Multiplication and Division Equations*****Get Ready for the Lesson**

Read the introduction at the top of page 70 in your textbook.

Write your answers below.

1. If d represents the number of days the bamboo has been growing, write a multiplication equation you could use to find how long it would take for the bamboo to reach a height of 210 inches.

Read the Lesson

Complete each sentence.

2. To solve $3x = 51$, _____ each side by 3.
3. To solve $\frac{b}{-2} = 4$, _____ each side by -2 .
4. To solve $-65 = -5t$, _____ each side by -5 .
5. To solve $-7 = \frac{d}{6}$, _____ each side by 6.

Explain how to solve each equation.

6. $\frac{u}{6} = 13$ _____

7. $-2c = -14$ _____

8. $64 = 16k$ _____

Solve each equation.

9. $8r = 32$

10. $3 = \frac{x}{7}$

11. $-9 = -9g$

Remember What You Learned

12. Write two multiplication and two division equations of your own. Trade your equations with a partner and solve. Explain to each other the method you used to solve the equations.

2-1**Lesson Reading Guide*****Rational Numbers*****Get Ready for the Lesson**

Read the introduction at the top of page 84 in your textbook. Write your answers below.

1. What fraction of the sites are in the United States?
2. What fraction of the sites are in Canada?
3. At what fraction of the sites might you see gray whales?
4. What fraction of the humpback viewing sites are in Mexico?

Read the Lesson

5. Explain the difference in meaning between the expressions $4\frac{3}{4}$ and $4\left(\frac{3}{4}\right)$.
6. Explain the difference between the numbers $2.5\overline{7}$ and $2.\overline{57}$.

Remember What You Learned

7. Notice that the first five letters of the word *rational* is the word *ratio*. Explain what a ratio is. If this term is not familiar to you, look it up in the dictionary. Write a ratio and a rational number. Explain how they are related.

2-2**Lesson Reading Guide****Comparing and Ordering Rational Numbers****Get Ready for the Lesson**

Read the introduction at the top of page 91 in your textbook. Write your answers below.

1. Do we recycle more or less than half of the paper we produce? Explain.
2. Do we recycle more or less than half of the aluminum cans? Explain.
3. Which items have a recycle rate less than one half?
4. Which items have a recycle rate greater than one half?
5. Using this estimation method, can you order the rates from least to greatest?

Read the Lesson

6. Read Example 4 on page 93. Explain how to use a number line to determine which of two rational numbers is the lesser number.

For Exercises 7 and 8, graph each pair of rational numbers on a number line. Then identify the lesser number.

7. $\frac{1}{5}, \frac{1}{3}$



8. $-\frac{4}{5}, -\frac{9}{10}$

**Remember What You Learned**

9. Order the numbers $\frac{3}{7}, \frac{3}{5}, \frac{3}{8}, \frac{3}{4}$, and $\frac{3}{11}$ from least to greatest. Then write a rule that helps you compare two positive fractions with the same numerator.

2-3**Lesson Reading Guide*****Multiplying Positive and Negative Fractions*****Get Ready for the Lesson**

Complete the Mini Lab at the top of page 96 in your textbook.

Write your answers below.

1. What is the product of $\frac{1}{3}$ and $\frac{2}{5}$?
2. Use an area model to find each product.
 - a. $\frac{3}{4} \cdot \frac{1}{2}$
 - b. $\frac{2}{5} \cdot \frac{2}{3}$
 - c. $\frac{1}{4} \cdot \frac{3}{5}$
 - d. $\frac{2}{3} \cdot \frac{4}{5}$
3. What is the relationship between the numerators of the factors and the numerator of the product?
4. What is the relationship between the denominators of the factors and the denominator of the product?

Read the Lesson

5. What is the greatest common factor of two numbers?
6. How is the greatest common factor used when multiplying fractions?
7. How is *dimensional analysis* defined on page 98 in your textbook?
8. How is dimensional analysis used in Example 5 on page 98 in your textbook?

Remember What You Learned

9. If you were to visit Europe, you may need to exchange some of your money for Euros. The *exchange rate* tells you how many dollars equals how many Euros. How would you use dimensional analysis to compute the number of Euros you would get from \$50?

2-4**Lesson Reading Guide*****Dividing Positive and Negative Fractions*****Get Ready for the Lesson**

Read the introduction at the top of page 102 in your textbook.

Write your answers below.

1. Find the value of $110 \div 4$.
2. Find the value of $110 \cdot \frac{1}{4}$.
3. Compare the values of $110 \div 4$ and $110 \cdot \frac{1}{4}$.
4. What can you conclude about the relationship between dividing by 4 and multiplying by $\frac{1}{4}$?

Read the Lesson

5. Describe the process for finding the multiplicative inverse of a mixed number.

For Exercises 6–9, write the multiplicative inverse of each mixed number.

6. $2\frac{1}{5}$

7. $-1\frac{3}{8}$

8. $3\frac{4}{7}$

9. $5\frac{5}{9}$

10. Explain how to divide by a fraction.
11. Look at your answers for Exercises 6 and 10 above. How do you divide a number by $2\frac{1}{5}$?

Remember What You Learned

12. Look up the word *invert* in the dictionary. Draw a simple picture and then invert it. Explain how this helps you remember how to divide fractions.

2-5**Lesson Reading Guide*****Adding and Subtracting Like Fractions*****Get Ready for the Lesson**

Read the introduction at the top of page 108 in your textbook.
Write your answers below.

1. What is the sum of the whole-number parts of the amounts?
2. How many $\frac{1}{3}$ cups are there?
3. Can you combine these ingredients in a 4-cup mixing bowl? Explain.

Read the Lesson

4. Define *like fractions*.

For Exercises 5–8, determine whether each pair of fractions are like fractions.

5. $\frac{3}{5}, \frac{3}{7}$

6. $\frac{5}{8}, \frac{7}{8}$

7. $\frac{4}{7}, -\frac{5}{7}$

8. $\frac{5}{9}, -\frac{2}{3}$

9. Explain how to add like fractions.
10. Explain how to subtract like fractions.

Add or subtract. Write in simplest form.

11. $\frac{3}{5} + \frac{1}{5}$

12. $\frac{5}{8} + \frac{7}{8}$

13. $\frac{5}{9} - \frac{2}{9}$

14. $\frac{4}{7} - \frac{5}{7}$

Remember What You Learned

15. Talk with a partner about the word *like*. What does it usually mean? How is this different from the way it is used in the lesson?

2-6**Lesson Reading Guide*****Adding and Subtracting Unlike Fractions*****Get Ready for the Lesson**

Read the introduction at the top of page 114 in your textbook.

Write your answers below.

1. What are the denominators of the fractions?
2. What is the least common multiple of the denominators?
3. Find the missing value in $\frac{1}{4} = \frac{?}{8}$.

Read the Lesson

4. What do *LCM* and *LCD* stand for? Give a definition for each.

Find the LCM of each pair of numbers.

5. 2, 3

6. 4, 6

7. 5, 10

8. 9, 12

Find the LCD of each pair of fractions.

9. $\frac{3}{5}, \frac{3}{7}$

10. $\frac{5}{8}, \frac{7}{12}$

11. $\frac{4}{7}, -\frac{5}{7}$

12. $\frac{5}{9}, -\frac{2}{3}$

13. Explain how to add or subtract unlike fractions.

Rewrite each sum or difference in terms of like fractions. Then add or subtract. Write in simplest form.

14. $\frac{3}{5} + \frac{1}{2}$

15. $\frac{3}{4} + \frac{7}{8}$

16. $\frac{5}{9} - \frac{2}{3}$

17. $\frac{4}{7} - \frac{1}{2}$

18. $\frac{3}{5} + \frac{3}{7}$

19. $\frac{5}{8} - \frac{7}{12}$

Remember What You Learned

20. Describe what the prefix *un-* usually means when it appears in front of a word. How does this meaning relate to unlike fractions?

2-7**Lesson Reading Guide*****Solving Equations with Rational Numbers*****Get Ready for the Lesson**

Read the introduction at the top of page 119 in your textbook.

Write your answers below.

1. Multiply each side of the equation by 6. Then divide each side by 5. Write the result.
2. Multiply each side of the original equation by the multiplicative inverse of $\frac{5}{6}$. Write the result.
3. What is the speed of a grizzly bear?
4. Which method of solving the equation seems most efficient?

Read the Lesson

5. Match the method of solving with the appropriate equation.

$$1.25a = 3.75 \quad \underline{\hspace{2cm}}$$

a. Subtract $\frac{3}{5}$ from each side.

$$x + 1.25 = 5.25 \quad \underline{\hspace{2cm}}$$

b. Multiply each by $\frac{5}{3}$.

$$\frac{3}{5}m = \frac{7}{10} \quad \underline{\hspace{2cm}}$$

c. Add 1.25 to each side.

$$r - 1.25 = 4.5 \quad \underline{\hspace{2cm}}$$

d. Divide each side by 1.25.

$$\frac{3}{5} + f = \frac{1}{2} \quad \underline{\hspace{2cm}}$$

e. Subtract 1.25 from each side.

Explain in words how to solve each equation.

6. $\frac{y}{3.2} = 1.1$

7. $\frac{3}{8} + v = \frac{7}{12}$

Remember What You Learned

8. The description of a problem often has more information than you need to design an equation and solve it. Describe the process of writing an equation to solve a problem.

2-9**Lesson Reading Guide*****Powers and Exponents*****Get Ready for the Lesson**

Read the introduction at the top of page 126 in your textbook.

Write your answers below.

1. How many 2s are multiplied to determine the number of great grandparents?
2. How many 2s would you multiply to determine the number of great-great grandparents?

Read the Lesson

3. Define the terms *base*, *exponent*, and *power*.

For Exercises 4–6, identify the base, exponent, and power in each expression.

4. 5^4

5. 7^{-2}

6. x^8

7. Explain in words what 5^4 means.

Rewrite each expression using multiplication instead of an exponent.

8. 5^4

9. 9^5

10. c^8

Evaluate each expression.

11. 5^4

12. 9^5

13. 6^3

14. 2^8

Remember What You Learned

15. Notice that $4^{-3} = \frac{1}{4^3}$. A power with a negative exponent is not negative.

Write a true sentence using the terms *negative exponent*, *power*, *positive*, and *rational*.

3-1 Lesson Reading Guide***Square Roots*****Get Ready for the Lesson**

Complete the Mini Lab at the top of page 144 in your textbook.

Write your answers below.

1. Copy and complete the following table.

Tiles on a Side	1	2	3	4	5
Total Number of Tiles in the Square Arrangement	1	4			

2. Suppose a square arrangement has 36 tiles. How many tiles are on a side?
3. What is the relationship between the number of tiles on a side and the number of tiles in the arrangement?

Read the Lesson

4. The opposite of _____ is finding one of two equal factors of a number.
5. Explain how you know whether a square root is the principal square root or not.
6. To solve an equation in which one side of the equation is a squared term, what can you do to each side of the equation?

Remember What You Learned

7. Given enough time and enough tiles, how might you go about determining whether a whole number is a perfect square?

3-2**Lesson Reading Guide*****Estimating Square Roots*****Get Ready for the Lesson**

Complete the Mini Lab at the top of page 148 in your textbook.

Write your answers below.

1. Place your square on the number line. Between what two consecutive whole numbers is $\sqrt{8}$, the side length of the square, located?
2. Between what two perfect squares is 8 located?
3. Estimate the length of a side of the square. Verify your estimate by using a calculator to compute the value $\sqrt{8}$.

Use grid paper to determine between which two consecutive whole numbers each value is located.

4. $\sqrt{23}$

5. $\sqrt{52}$

6. $\sqrt{27}$

7. $\sqrt{18}$

Read the Lesson

8. Explain how you can estimate the square root of a number if you know perfect squares greater than and less than the number.

For Exercises 9–12, estimate to the nearest whole number.

9. $\sqrt{33}$

10. $\sqrt{71}$

11. $\sqrt{114}$

12. $\sqrt{211}$

13. Read Example 3 on page 149 of your textbook. What is a “golden rectangle”?

Remember What You Learned

14. Draw a triangle and label its sides. (Make sure your triangle is a real triangle. For example, sides of lengths 2, 2 and 8 do not make a triangle.) Trade triangles with a partner and estimate the area of your triangles using Heron’s Formula.

3-4 Lesson Reading Guide***The Real Number System*****Get Ready for the Lesson**

Read the introduction at the top of page 155 in your textbook.
Write your answers below.

1. The length of the court is 60 feet. Is 60 a rational number? Explain.
2. The distance from the net to the rear spikers line is $7\frac{1}{2}$ feet. Is $7\frac{1}{2}$ a rational number? Explain.
3. The diagonal across the court is $\sqrt{4,500}$ feet. Can this square root be written as a rational number? Explain.

Read the Lesson

4. What do rational and irrational numbers have in common? What is the difference between rational numbers and irrational numbers? Give an example of each.

5. Match the property of real numbers with the algebraic example.

Commutative _____

a. $(x + y) + z = x + (y + z)$

Associative _____

b. $pq = qp$

Distributive _____

c. $h + 0 = h$

Identity _____

d. $c + (-c) = 0$

Inverse _____

e. $x(y + z) = xy + xz$

Remember What You Learned

6. Think of a way to remember the relationships between the sets of numbers in the real number system. For example, think of a rhyme that tells the order of the sets of numbers from smallest to largest.

3-5 Lesson Reading Guide***The Pythagorean Theorem*****Get Ready for the Lesson**

Complete the Mini Lab at the top of page 162 in your textbook.

Write your answers below.

1. What is the relationship between the values in the $H^2 + B^2$ column and the values in the L column?
2. How could you use a value in the $H^2 + B^2$ column to find a corresponding value in the L column?

Read the Lesson

3. Is it possible to have a right triangle for which the Pythagorean Theorem is *not* true?
4. If you know the lengths of two of the sides of a right triangle, how can you find the length of the third side?

Use the Pythagorean Theorem to determine whether each of the following measures of the sides of a triangle are the sides of a right triangle.

- | | |
|---------------|--------------|
| 5. 4, 5, 6 | 6. 9, 12, 15 |
| 7. 10, 24, 26 | 8. 5, 7, 9 |

Remember What You Learned

9. In everyday language, a *leg* is a limb used to support the body. How does this meaning relate to the legs of a right triangle?

3-6 Lesson Reading Guide***Using the Pythagorean Theorem*****Get Ready for the Lesson**

Read the introduction at the top of page 167 in your textbook.

Write your answers below.

1. What type of triangle is formed by the horizontal distance, the vertical height, and the length of the towrope?
2. Write an equation that can be used to find the length of the towrope.

Read the Lesson

Determine whether each of the following is a Pythagorean triple.

3. 13-84-85
4. 11-60-61
5. 21-23-29
6. 12-25-37
7. The triple 8-15-17 is a Pythagorean triple. Complete the table to find more Pythagorean triples.

	a	b	c	Check: $c^2 = a^2 + b^2$
original	8	15	17	$289 = 64 + 225$
$\times 2$				
$\times 3$				
$\times 5$				
$\times 10$				

8. If the sides of a square are of length s , how can you find the length of a diagonal of the square?

Remember What You Learned

9. Work with a partner. Write a word problem that can be solved using the Pythagorean Theorem, including the art. Exchange problems with your partner and solve.

3-7**Lesson Reading Guide*****Distance on the Coordinate Plane*****Get Ready for the Lesson**

Read the introduction at the top of page 173 in your textbook.

Write your answers below.

1. What does each colored line on the graph represent?
2. What type of triangle is formed by the lines?
3. What are the lengths of the two red lines?

Read the Lesson

4. On the coordinate plane, what are the four sections determined by the axes called?
5. Match each term of the coordinate plane with its description.

ordinate	_____	a. point where number lines meet
y-axis	_____	b. x-coordinate
origin	_____	c. y-coordinate
abscissa	_____	d. vertical number line
x-axis	_____	e. horizontal number line
6. To find the distance between two points, draw a right triangle whose hypotenuse is the distance you want to find; find the lengths of the legs, and use _____ to solve the problem.

Remember What You Learned

7. Think of a way to remember the names of the four quadrants of the coordinate plane.

4-1**Lesson Reading Guide*****Ratios and Rates*****Get Ready for the Lesson**

Read the introduction at the top of page 190 in your textbook.

Write your answers below.

1. To make the batch of trail mix, how many scoops of raisins should you use for every 1 scoop of peanuts? Explain your reasoning.

Read the Lesson

2. What does it mean if the ratio of red marbles to blue marbles is 3 to 5?
3. What is another way to write the ratio *3 to 5*?
4. What must you do before you can simplify the ratio *30 minutes to 8 hours*? What is the simplified ratio?

Remember What You Learned

5. When you go to a bank to exchange money of one currency for another, the bank uses a conversion rate to calculate the amount of money in the new currency. Find out what the current conversion rate is to exchange U.S. dollars to Canadian dollars at a local bank. Then write the rate as a ratio of one currency compared to the other.

4-2**Lesson Reading Guide*****Proportional and Nonproportional Relationships*****Get Ready for the Lesson**

Read the introduction at the top of page 194 in your textbook.

Write your answers below.

- Complete the table shown to determine the cost for different-sized orders.

Pizzas Ordered	1	2	3	4
Cost of Order (\$)	8			

- Express the relationship between the cost of an order and number of pizzas ordered for each set of values as a ratio in simplest form. What do you notice?

Read the Lesson

- At Better Shirts, an order of 10 printed T-shirts is \$45 and an order of 250 printed T-shirts is \$875. What must you do before you can compare the ratios to see if they are proportional?
- What must be true in order for the ratios to be proportional?
- What are the simplified ratios for the T-shirt orders? Are the ratios proportional or nonproportional?

Remember What You Learned

- A delivery service charges \$7 per package delivered locally. There is also a \$2 service charge for registering an order of packages for any number of packages. Create a table to show what the costs of sending 1, 2, 3, and 4 packages are, using the service. Is the relationship between total cost and number of packages proportional or nonproportional? Explain your reasoning.

4-3**Lesson Reading Guide*****Solving Proportions*****Get Ready for the Lesson**

Read the introduction at the top of page 198 in your textbook.

Write your answers below.

1. Write a ratio in simplest form that compares the number of Calories from fat to the total number of Calories.
2. Suppose you plan to eat two such granola bars. Write a ratio comparing the number of Calories from fat to the total number of Calories.
3. Is the ratio of Calories from fat proportional to the total number of Calories for one and two bars? Explain your reasoning.

Read the Lesson

4. Complete the sentence: If two ratios form a proportion, then the ratios are said to be _____.
5. Do the ratios $\frac{a}{b}$ and $\frac{c}{d}$ always form a proportion? Why or why not?
6. Explain how you can use cross products to solve proportions in which one of the terms is not known.

Remember What You Learned

7. For the proportion $\frac{a}{b}$ and $\frac{c}{d}$, why do you think the products ad and bc are called *cross products*?

4-5**Lesson Reading Guide*****Similar Polygons*****Get Ready for the Lesson**

Complete the Mini Lab at the top of page 205 in your textbook.

Write your answers below.

1. Compare the angles of the triangles by matching them up. Identify the angle pairs that have equal measure.
2. Express the ratios $\frac{DF}{LK}$, $\frac{EF}{JK}$, and $\frac{DE}{LJ}$ to the nearest tenth.
3. What do you notice about the ratios of the matching sides of matching triangles?

Read the Lesson

4. Complete the sentence: If two polygons are similar, then their corresponding angles are _____, and their corresponding sides are _____.
5. If two polygons have corresponding angles that are congruent, does that mean that the polygons are similar? Why or why not?
6. If the sides of one square are 3 centimeters and the sides of another square are 9 centimeters, what is the ratio of corresponding sides from the first square to the second square?

Remember What You Learned

7. Look up the everyday definition of the word *similar* in a dictionary. How does the definition relate to what you learned in this lesson?

4-6**Lesson Reading Guide*****Dilations*****Get Ready for the Lesson**

Complete the Mini Lab at the top of page 213 in your textbook.

Write your answers below.

1. Measure and compare corresponding lengths on the original figure and the new figure. Describe the relationship between these measurements? How does this relate to the change in grid size?
2. **MAKE A CONJECTURE** What size squares should you use to create a version of the original figure with dimensions that are four times the corresponding lengths on the original? Explain.

Read the Lesson

3. If you are given the coordinates of a figure and the scale factor of a dilation of that figure, how can you find the coordinates of the new figure?
4. When you graph a figure and its image after a dilation, how can you check your work?

Remember What You Learned

5. Complete the table below to help you remember the effects of different scale factors.

If the scale factor is	Then the dilation is
between 0 and 1	
greater than 1	
equal to 1	

4-7**Lesson Reading Guide*****Scale Drawings and Models*****Get Ready for the Lesson**

Read the introduction at the top of page 220 in your textbook.

Write your answers below.

1. How many units wide is the room?
2. The actual width of the room is 18 feet. Write a ratio comparing the drawing width to the actual width.
3. Simplify the ratio you found and compare it to the scale shown at the bottom of the drawing.

Read the Lesson

4. Give another example of a scale drawing or scale model that is different from the examples of scale drawings and scale models given on page 220 in your textbook.
5. Complete the sentence: distances on a scale model are _____ to distances in real life.
6. What is the scale factor for a model if part of the model that is 4 inches corresponds to a real-life object that is 16 inches?

Remember What You Learned

7. Make a scale drawing of a room, such as your classroom or your bedroom. Select an appropriate scale so that your drawing is a reasonable size. Be sure to indicate your scale on your drawing. Use another piece of paper if necessary.

4-8**Lesson Reading Guide*****Indirect Measurement*****Get Ready for the Lesson**

Read the introduction at the top of page 226 in your textbook.

Write your answers below.

1. How is the caveman measuring the distance to the Sun?

Read the Lesson

2. Complete the following sentence.
When you solve a problem using shadow reckoning, the objects being compared and their shadows form two sides of _____.
3. Suppose that you are standing near a building and you see the shadows cast by you and the building. If you know the length of each of these shadows and you know how tall you are, write a proportion in words that you can use to find the height of the building.
4. **STATUE** If a statue casts a 6-foot shadow and a 5-foot mailbox casts a 4-foot shadow, how tall is the statue?

Remember What You Learned

5. Work with a partner. Have your partner draw two triangles that are similar with the lengths of two corresponding sides labeled and the length of one additional side labeled. Tell your partner how to write a proportion to solve for the length of the side corresponding to the additional side labeled.

4-9**Lesson Reading Guide*****Rate of Change*****Get Ready for the Lesson**

Read the introduction at the top of page 230 in your textbook.

Write your answers below.

1. What is the change in the number of entries from 2004 to 2006?
2. Over what number of years did this change take place?
3. Write a rate that compares the change in the number of entries to the change in the number of years. Express your answer as a unit rate and explain its meaning.

Read the Lesson

4. What does a rate of change measure on a graph?
5. On a graph, what does it mean when a rate of change is negative?
6. Complete the sentence: When a quantity does not change over a period of time, it is said to have a _____ rate of change.

Remember What You Learned

7. Write out in words the formula for finding a rate of change between two data points (x_1, y_1) and (x_2, y_2) .

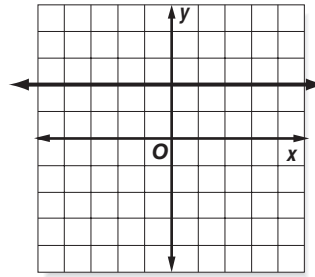
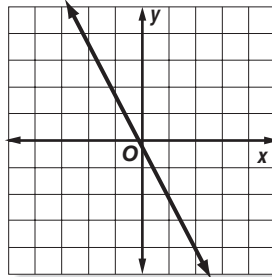
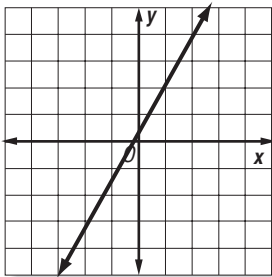
4-10**Lesson Reading Guide****Constant Rate of Change****Get Ready for the Lesson**

Read the introduction at the top of page 236 in your textbook. Write your answers below.

- Pick several pairs of points from those plotted and find the rate of change between them. What is true of these rates?

Read the Lesson

- The rate of change between two points on a line can be negative, positive, or zero. Label each of the following graphs as negative, positive, or zero.

**Remember What You Learned**

- A linear relationship is defined as having a constant rate of change between any two points along the line. Look at the following points and determine if they have a linear relationship: $(0,0)$, $(1,2)$, $(3,5)$, $(4,9)$, $(5,15)$.

5-1**Lesson Reading Guide*****Ratios and Percents*****Get Ready for the Lesson**

Read the introduction at the top of page 252 in your textbook.

Write your answers below.

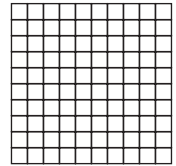
1. Name two states from the table that have ratios in which the second numbers are the same.
2. How can you determine which of the four states has the greatest ratio of people under 18 to total population?

Read the Lesson

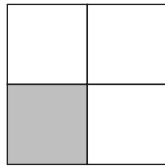
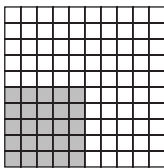
3. How is *percent* defined on page 252 of your textbook?

For Exercises 5 and 6, use the grid at the right.

4. Describe how the grid at the right can be used to represent percents.



5. Fill in the grid to represent 55%.
6. What ratio is represented by each grid? How do the two ratios compare to each other? What percent do they represent?

**Remember What You Learned**

7. Work with a partner. Make up a silly statement involving a ratio, for example, “4 out of 5 of the diddlewads were goraks.” Your partner writes the ratio as a fraction and a percent. Then your partner makes up a different percent and you write the percent as a fraction in simplest form. Start again with your partner making up a silly ratio statement this time.

5-2**Lesson Reading Guide****Comparing Fractions, Decimals, and Percents****Get Ready for the Lesson**

Read the introduction at the top of page 256 in your textbook.

Write your answers below.

1. Write each percent as a fraction. Do not simplify the fractions.
2. Write each fraction in Question 1 as a decimal.
3. How could you write a percent as a decimal without writing the percent as a fraction first?

Read the Lesson

Complete each sentence.

4. To write a decimal as a percent, _____ by 100 and add the percent symbol.
5. To write a percent as a decimal, _____ by 100 and remove the percent symbol.
6. Dividing by 100 is the same as moving the decimal point two places to the _____.
7. Multiplying by 100 is the same as moving the decimal point two places to the _____.

Determine whether each expression represents changing from a decimal to a percent or a percent to a decimal.

8. $0.\overbrace{435}$ _____

9. $\overbrace{14.5}$ _____

10. $33.\overbrace{60}$ _____

11. $\overbrace{07.819}$ _____

Remember What You Learned

12. Work with a partner. Pretend your partner has not studied this lesson. On a piece of paper, write a percent and a decimal using different numbers. Teach your partner how to write a percent as a decimal and how to write a decimal as a percent. Be sure to show how to place the decimal point.

5-3

Lesson Reading Guide

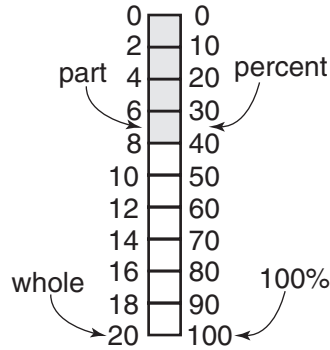
Algebra: The Percent Proportion

Get Ready for the Lesson

Complete the Mini Lab at the top of page 263 in your textbook.

Write your answers below.

1. What is 40% of 5?
2. 4 is 80% of what number?
3. Draw a model and find what percent 7 is of 20.



Read the Lesson

4. Look at page 263 in your textbook. Fill in the blanks to complete the percent proportion.

_____ =

5. Complete the table for each statement or problem. For a quantity that needs to be found, put a question mark in the appropriate column.

- a. 14 is 20% of 70.
- b. 6% of 40 is 2.4
- c. 13 out of 25 is 52%
- d. What is 30% of 65?
- e. Find 41% of 250.
- f. What percent of 25 is 18?

part	whole	percent

Remember What You Learned

6. Use a clean sheet of paper and Examples 1–3 on pages 263 and 264 in your textbook. Starting with Example 1, cover up everything in the example with your paper except the title and its question. Now try to work the problem without looking at the book. Then compare your work to the work in the book. Repeat this with the other two examples.

5-4**Lesson Reading Guide*****Finding Percents Mentally*****Get Ready for the Lesson**

Read the introduction at the top of page 268 in your textbook.

Write your answers below.

- 50% of the eighth grade class are girls. How could you find 50% of 104 mentally?
- Use mental math to find the number of girls in the eighth grade class.
- 25% of the sixth grade class play basketball. Use mental math to find the number of students in the sixth grade who play basketball.

Read the Lesson

- Complete the following table.

Percent	Fraction	Decimal
25%		
	$\frac{1}{10}$	

Complete each statement.

- 40% of 25 = _____ of 25 or 10
- _____ of 36 = $\frac{1}{4}$ of 36 or 9
- $66\frac{2}{3}\%$ of 48 = _____ of 48 or 32
- _____ of 89 = 0.1 of 89 or 8.9

Remember What You Learned

- Work alone or with a partner. Look at the Percent-Fraction Equivalents table at the bottom of page 268 in your textbook. Create your own table on a sheet of paper or poster paper. Underneath each equivalent percent and fraction, write an example in which knowing the fraction helps you find the percent mentally.

5-6**Lesson Reading Guide*****Percent and Estimation*****Get Ready for the Lesson**

Read the introduction at the top of page 275 in your textbook.

Write your answers below.

1. Round the total area of Earth to the nearest hundred million square miles.
2. Round the percent of Earth that is land to the nearest ten percent.
3. Use mental math in to estimate the area of the land on Earth.

Read the Lesson

4. What are compatible numbers?
5. Are $\frac{1}{8}$ and 56 compatible numbers? Explain.
6. Are $\frac{6}{7}$ and 32 compatible numbers? Explain.

Remember What You Learned

Describe how to estimate the following using compatible numbers.

7. 65% of 64
8. 18 out of 59 is what percent

5-7**Lesson Reading Guide*****Algebra: The Percent Equation*****Get Ready for the Lesson**

Read the introduction at the top of page 279 in your textbook.

Write your answers below.

1. Use a percent proportion to find the area of water in New York.
2. Express the percent for New York as a decimal. Multiply the total area of New York by this decimal.
3. How are the answers for Exercises 1 and 2 related?

Read the Lesson

4. What is the *percent equation*?

Write each percent proportion as a percent equation.

5. $\frac{16}{64} = \frac{25}{100}$ _____

6. $\frac{x}{14} = \frac{2}{100}$ _____

7. $\frac{96}{b} = \frac{48}{100}$ _____

8. $\frac{13}{100} = \frac{p}{675}$ _____

Remember What You Learned

9. Write the percent equation in its three forms. Then choose the best form to find the total price of a jacket after sales tax. Use the sales tax percent for where you live. Find out or estimate to the nearest whole number what you think a jacket will cost where you live.

5-8

Lesson Reading Guide

Percent of Change

Get Ready for the Lesson

Read the introduction at the top of page 284 in your textbook. Write your answers below.

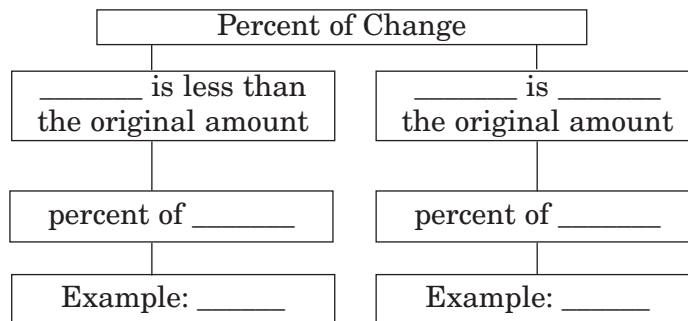
1. How much did the price increase from 1930 to 1940?
2. Write the ratio $\frac{\text{amount of increase}}{\text{price in 1930}}$. Then write the ratio as a percent.
3. How much did the price increase from 1940 to 1950? Write the ratio $\frac{\text{amount of increase}}{\text{price in 1940}}$. Then write the ratio as a percent.
4. How much did the price increase from 1950 to 1960? Write the ratio $\frac{\text{amount of increase}}{\text{price in 1950}}$. Then write the ratio as a percent.
5. **MAKE A CONJECTURE** Why are the amounts of increase the same but the percents are different?

Read the Lesson

6. Explain the relationship between selling price and markup.

Remember What You Learned

7. When a book has many new terms or ideas, you can sometimes make an outline or concept map to help you understand the information. Read about the new terms on page 284 and the ones just before each example on pages 285 and 286. Then complete the concept map below using these words: discount, more than, new amount, markup, decrease, increase.



5-9**Lesson Reading Guide*****Percent of Change*****Get Ready for the Lesson**

Read the introduction at the top of page 290 in your textbook.

Write your answers below.

1. If Hector puts his money in a savings account, he will receive 2.5% of \$1,000 in interest for one year. Find the interest Hector will receive.
2. Compare the interest Hector can receive in one year from a money market and from a certificate of deposit.

Read the Lesson

3. Look up the word *interest* in a dictionary. Read some of the different definitions. Find and write a definition that seems to match the topic in your textbook.
4. Read the paragraph just below the activity on page 290 in your textbook. What is the difference between how interest is applied to a customer for a savings account and for a credit card?
5. The words *principle* and *principal* are often confused. Look up both words in a dictionary. Which word would you use to describe the person in charge of your school and also the money invested or borrowed? Which word would you use to describe a rule of conduct?

Remember What You Learned

6. Find out about what interest rate a bank near you pays on a savings account and what interest rate it charges on a credit card. Compute how much interest you would earn on \$600 after 2 years. Then compute how much interest you would have to pay on a credit card if you borrowed \$600 for 2 years.

6-1**Lesson Reading Guide*****Line and Angle Relationships*****Get Ready for the Lesson**

Read the introduction at the top of page 306 in your textbook.

Write your answers below.

1. Suppose that the measures of angles 4 and 6 are each 60° . Using angle relationships you have previously learned, or a protractor, find and record the measure of each numbered angle. Explain your reasoning.
2. What is the relationship between the two horizontal lines?
3. *Congruent angles* are angles that have the same measure. Describe the pairs of angles that appear to be congruent.
4. What do you notice about the measures of angles that are side by side?

Read the Lesson

5. How do you know if two lines are perpendicular?
6. How can you tell the difference between alternate interior and alternate exterior angles?

Remember What You Learned

7. Work with a partner. Have your partner draw two angles. Identify the types of angles your partner has drawn.

6-3**Lesson Reading Guide*****Polygons and Angles*****Get Ready for the Lesson**

Read the introduction at the top of page 314 in your textbook.

Write your answers below.

1. Predict the number of triangles and the sum of the angle measures in a polygon with 8 sides.
2. Write an algebraic expression that could represent the number of triangles in an n -sided polygon. Then write an expression to represent the sum of the angle measures in an n -sided polygon.

Read the Lesson

3. How many triangles would be in a 12-sided polygon?
4. Why do you think that you need to subtract 2 from the number of sides?
5. What do you call the angles that lie inside a polygon?

Remember What You Learned

6. The outside walls of a sports stadium create a giant regular 60-sided figure. Write an equation to find the number of triangles inside the figure. Then write and solve an equation to find the sum of the interior angles of the figure.

6-5 Lesson Reading Guide**Symmetry****Get Ready for the Lesson**

Complete the Mini Lab at the top of page 325 in your textbook.

Write your answers below.

1. Draw a line through the center of the pentagon. Then fold your paper across this line. What do you notice about the two halves?
2. Are there other lines you can draw that will produce the same result? If so, how many?
3. Place the transparency over the outline on your tracing paper. Use your pencil point at the center of the pentagon to hold the transparency in place. How many times can you rotate the transparency from its original position so that the two figures match?
4. Find the first angle of rotation by dividing 360° by the number of times the figures matched.
5. List the other angles of rotation by adding the measure of the first angle of rotation to the previous angle measure. Stop when you reach 360° .

Read the Lesson

6. What is a line of symmetry?
7. What does it mean to rotate a figure?
8. After a 360° rotation about its center, a figure looks exactly as it does in its original position. Does this mean that the figure has rotational symmetry? Explain.

Remember What You Learned

9. Name two everyday things that have rotational symmetry. Explain how you know these items have rotational symmetry.

6-6 Lesson Reading Guide**Reflections****Get Ready for the Lesson**

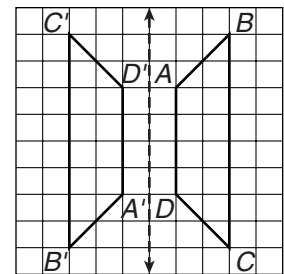
Read the introduction at the top of page 330 in your textbook.

Write your answers below.

1. Compare the shape and size of the bird to its image in the water.
2. Compare the perpendicular distance from the water line to each of the points shown. What do you observe?
3. The points A , B , and C appear *counterclockwise* on the bird. How are these points oriented on the bird's image?

Read the Lesson

For Exercises 4–7, read the **Concept Summary** information on page 330 in your textbook and refer to the graph at the right that shows quadrilaterals $ABCD$ and $A'B'C'D'$ and a line.



4. Find the distance of each vertex from the given line. Are corresponding vertices, such as A and A' , the same distance from the line?
5. Are quadrilaterals $ABCD$ and $A'B'C'D'$ congruent? Explain.
6. Do the vertices A , B , C , and D appear clockwise or counterclockwise on quadrilateral $ABCD$? Do the vertices A' , B' , C' , and D' appear clockwise or counterclockwise on quadrilateral $A'B'C'D'$? Do the two figures have the same orientation?
7. Is quadrilateral $A'B'C'D'$ a reflection of quadrilateral $ABCD$ over the given line? Why or why not?

Remember What You Learned

8. Find two real-life examples of objects that have line symmetry. Then draw a sketch of each so that the sketch can be reflected over a line to produce a drawing of the entire object.

6-7 Lesson Reading Guide**Translations****Get Ready for the Lesson**

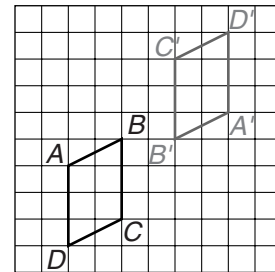
Read the introduction at the top of page 335 in your textbook.

Write your answers below.

1. Describe the motion involved in moving the knight.
2. Compare the shape, size, and orientation of the knight in its original position to that of the knight in its new position.

Read the Lesson

For Exercises 3–6, read the **Concept Summary** information on page 335 in your textbook and refer to the graph at the right that shows quadrilaterals $ABCD$ and $A'B'C'D'$.



3. Determine how many units up and to the right each vertex of quadrilateral $ABCD$ has moved to get to the corresponding vertex of quadrilateral $A'B'C'D'$. Have all the vertices moved the same distance in the same direction?
4. Are quadrilaterals $ABCD$ and $A'B'C'D'$ congruent? Explain.
5. Do the vertices A , B , C , and D appear clockwise or counterclockwise on quadrilateral $ABCD$? Do the vertices A' , B' , C' , and D' appear clockwise or counterclockwise on quadrilateral $A'B'C'D'$? Do the two figures have the same orientation?
6. Is quadrilateral $A'B'C'D'$ a translation of quadrilateral $ABCD$? Why or why not?

Remember What You Learned

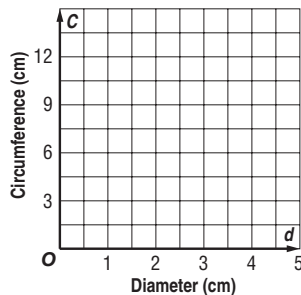
7. Translations and reflections are both types of transformations. One way to remember the difference between them is to note that a translation is a slide while a reflection is a flip. Come up with your own ways to help you distinguish between the different types of transformations.

7-1**Lesson Reading Guide*****Circumference and Area of Circles*****Get Ready for the Lesson**

Complete the Mini Lab at the top of page 352 in your textbook.

Write your answers below.

1. What distance does C represent?
2. Find the ratio $\frac{C}{d}$ for this object.
3. Repeat the steps above for at least two other circular objects and compare the ratios of C to d . What do you observe?
4. Graph the data you collected as ordered pairs, (d, C) . Then describe the graph.

**Read the Lesson**

5. Explain the difference between the radius and the diameter of a circle.
6. What is the ratio of the circumference of a circle to its diameter?
7. Explain how you find the circumference of a circle given its radius is 4 inches.

Remember What You Learned

8. One way to help you remember a formula or concept is to make up a saying. For example, to remember the formula for the area of a circle you might use, "Fuzzy Wuzzy was a bear; area equals π (pi) r squared." Make up your own sayings to help you remember the formulas for the circumference and area of circles.

7-3**Lesson Reading Guide*****Area of Composite Figures*****Get Ready for the Lesson**

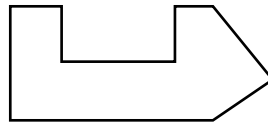
Read the introduction at the top of page 360 in your textbook.

Write your answers below.

1. Identify some of the polygons that make up the family room, nook, and foyer area shown in this floor plan.
2. How can the polygons be used to find the total area that will be carpeted?

Read the Lesson

3. What is a complex figure?
4. What is the first step in finding the area of a complex figure?
5. Explain how to divide up the figure shown.

**Remember What You Learned**

6. Look up the everyday definition of the word *complex* in a dictionary. How does the definition relate to what you learned in the lesson?

7-4**Lesson Reading Guide*****Three-Dimensional Figures*****Get Ready for the Lesson**

Read the introduction at the top of page 365 in your textbook.

Write your answers below.

1. Name the two-dimensional shapes that make up the sides of this crystal.
2. If you observed the crystal from directly above, what two-dimensional figure would you see?
3. How are two- and three-dimensional figures related?

Read the Lesson

4. A plane is a two-dimensional flat surface that extends in all directions. What is formed when two planes intersect?
5. How can you tell the difference between a prism and pyramid?
6. Identify a three-dimensional figure that has one base that is a hexagon and six other faces that are triangles.

Remember What You Learned

7. Visualize your classroom as a prism with yourself sitting in the middle of the room. What parts of the classroom represent an edge, a face, and a vertex?

7-5**Lesson Reading Guide*****Volume of Prisms and Cylinders*****Get Ready for the Lesson**

Complete the Mini Lab at the top of page 371 in your textbook.

Write your answers below.

1. Describe how the volume V of each prism is related to its length ℓ , width w , and height h .
2. Describe how the area of the base B and the height h of each prism is related to its volume V .

Read the Lesson

3. What is another way to write the volume of a rectangular prism other than $V = Bh$?
4. What does it mean if a figure has a volume of 120 cubic centimeters?
5. Explain how finding the volume of a complex solid is similar to finding the area of a complex figure.

Remember What You Learned

6. Complete the table below by filling in the correct formula.

Figure	Formula for Finding Volume
rectangular prism	
triangular prism	
cylinder	

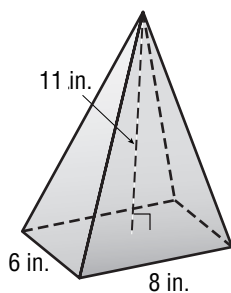
7-6**Lesson Reading Guide*****Volume of Pyramids, Cones, and Spheres*****Get Ready for the Lesson**

Complete the Mini Lab at the top of page 379 in your textbook.
Write your answers below.

1. Compare the base areas and the heights of the two solids.
2. Fill the pyramid with rice, sliding a ruler across the top to level the amount. Pour the rice into the cube. Repeat until the prism is filled. How many times did you fill the pyramid in order to fill the cube?
3. What fraction of the cube's volume does one pyramid fill?

Read the Lesson

4. How is the volume of a cone related to that of a cylinder?
5. How is the volume of a pyramid related to that of a prism?
6. Fill in the table about what you know from the diagram. Then compute the volume of the pyramid.



length of rectangle	
width of rectangle	
area of base	
height of pyramid	
volume of pyramid	

Remember What You Learned

7. Why do you think that the volume of a sphere is larger than the volume of a cube with sides the length of the sphere's radius?

7-7**Lesson Reading Guide*****Surface Area of Prisms and Cylinders*****Get Ready for the Lesson**

Complete the Mini Lab at the top of page 386 in your textbook.

Write your answers below.

1. Find the area of each face. Then find the sum of these areas.
2. Find the perimeter of one of the bases. Then multiply the perimeter by the height of the box. What does this product represent?
3. Add the product from Exercise 2 to the sum of the areas of the two bases.
4. Compare your answers from Exercises 1 and 3.

Read the Lesson

5. Complete the sentence with the correct numbers. When you draw a net of a triangular prism, there are ____ congruent triangular faces and _____ rectangular faces.
6. Explain how using a net helps to find the surface area of a figure.
7. If you unroll a cylinder, what does the net look like?

Remember What You Learned

8. Surface area contains the word *face*. Remember to turn the object so that each side *faces* you, and no face is left out. Fill in the chart to help you remember how many faces you should be looking for in each figure.

Figure	Total Number of Faces
rectangular prism	
triangular prism	

7-8 Lesson Reading Guide**Surface Area of Pyramids****Get Ready for the Lesson**

Read the introduction at the top of page 393 in your textbook.

Write your answers below.

1. How many cloth faces does this pyramid have? What shape are they?
2. How could you find the total area of the material used for the parachute?

Read the Lesson

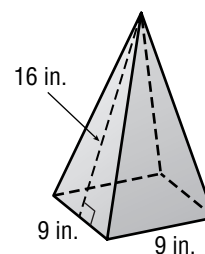
3. Complete the steps in finding the lateral and total surface areas of a pyramid.

Lateral Surface Area

$$L = \frac{1}{2} P\ell \quad \underline{\hspace{2cm}}$$

$$L = \frac{1}{2}(36)(16) \quad \underline{\hspace{2cm}}$$

$$L = \underline{\hspace{1cm}} \quad \underline{\hspace{2cm}}$$

**Total Surface Area**

$$S = L + B \quad \underline{\hspace{2cm}}$$

$$S = \underline{\hspace{1cm}} + 9^2 \quad \underline{\hspace{2cm}}$$

The lateral surface area is _____ square inches, and the total surface area of the pyramid is $288 + 81 = \underline{\hspace{2cm}}$ square inches.

4. What two areas are needed to calculate the surface area of a pyramid?
5. In a pyramid, what is the altitude of each face called?

Remember What You Learned

6. Explain how the slant height of a pyramid is different from the height of the pyramid. Find a real-life example of a solid pyramid and use it to determine whether it is easier to measure the height or the slant height of a pyramid. Explain your reasoning.

7-9**Lesson Reading Guide*****Similar Solids*****Get Ready for the Lesson**

Read the introduction at the top of page 399 in your textbook.

Write your answers below.

1. If the model car is 4.2 inches long, 1.6 inches wide, and 1.3 inches tall, what are the dimensions of the original car?
2. Make a conjecture about the radius of the wheel of the original car compared to the model.

Read the Lesson

3. What is the scale factor for two similar solids?
4. If a 6-meter high pyramid is a model of an actual Egyptian pyramid and the scale factor is $\frac{1}{8}$, what is the height of the actual pyramid?
5. A cube has a volume of 216 cubic feet. A smaller cube is similar by a scale factor of 2. What is the length of a side of the smaller cube?

Remember What You Learned

6. You can calculate the slant height of either pyramid using the Pythagorean Theorem by creating a right triangle with the pyramid's height, its slant height, and $\frac{1}{2}$ of the side of the square base. The slant height is the hypotenuse. The slant height of the larger pyramid is about 8.4 meters. How can you find the slant height of the smaller pyramid without using the Pythagorean Theorem?

8-1

Lesson Reading Guide

Counting Outcomes

Get Ready for the Lesson

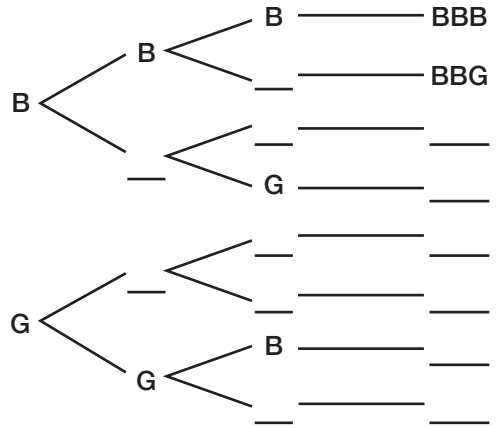
Read the introduction at the top of page 416 in your textbook.
Write your answers below.

1. How many different styles are available? colors? sizes?
2. Make a list showing all of the different bicycles that are available.

Read the Lesson

3. Complete the tree diagram shown below for how many boys and how many girls are likely to be in a family of three children.

Child 1 Child 2 Child 3 Sample Outcome



4. Explain when you would not want to use a tree diagram.

Remember What You Learned

5. Make a simple lunch menu. Include at least two sandwich choices, 3 side choices, and 3 dessert choices. Then write a sentence describing how you could determine the number of different meals that can be made by choosing only one item from each category.

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Lesson 8-1

8-2**Lesson Reading Guide*****Permutations*****Get Ready for the Lesson**

Complete the Mini Lab at the top of page 421 in your textbook.

Write your answers below.

1. How many different arrangements did you make?
2. How many different game pieces could you pick for the first place?
3. Once you pick the first-place game piece, how many game pieces could you pick for the second place?
4. Use the Fundamental Counting Principle to determine the number of arrangements for first and second places.
5. How do the numbers in Exercises 1 and 4 compare?

Read the Lesson

6. Complete the sentence: An arrangement or listing in which order is important is called a _____.
7. What does the notation $P(14, 4)$ represent?
8. What is another way to write $5 \cdot 4 \cdot 3 \cdot 2 \cdot 1$?
9. A security system has a number pad with 9 digits. How many three-number passwords are available if a digit cannot be repeated? If a digit can be repeated, how many passwords are available?

Remember What You Learned

10. An arrangement or listing in which order is important is called a permutation. Think about the word permutation. How can you remember that order is important? Give an example of when order would be important.

8-3**Lesson Reading Guide*****Combinations*****Get Ready for the Lesson**

Complete the Mini Lab at the top of page 425 in your textbook.
Write your answers below.

1. How many different handshakes did you record?
2. Is the number of handshakes equal to $P(6, 2)$? Explain.

Read the Lesson

3. What is the difference between a permutation and a combination?
4. Fill in the blanks. Find $C(9, 4)$.

$$C(9, 4) = \frac{9 \cdot 8 \cdot 7 \cdot 6}{4 \cdot 3 \cdot 2 \cdot 1}$$

$$= \frac{9 \cdot \cdot \cdot}{4 \cdot \cdot \cdot}$$

$$= \underline{\hspace{2cm}}$$

5. Are there more combinations or permutations of 3 people chosen from a group of 6 people? Explain.

Remember What You Learned

6. You and a friend walk into a fast-food restaurant and each order the same combination meal. You receive your meal in the order of hamburger, french fries, and drink. Your friend receives her meal in the order of french fries, drink, and hamburger. You each ordered the same combination meal but the order in which you received your food did not matter. Give another example for which order does not matter.

8-4**Lesson Reading Guide*****Probability of Composite Experiments*****Get Ready for the Lesson**

Read the introduction at the top of page 429 in your textbook.
Write your answers below.

1. A player rolls the number cube. What is $P(\text{odd number})$?
2. The player spins the spinner. What is $P(\text{red})$?
3. What is the product of the probabilities in Exercises 1 and 2?
4. On a separate piece of paper, draw a tree diagram to determine the probability that the player will roll an odd number and spin red.

Read the Lesson

5. What is a compound event?
6. Are the events of spinning a spinner and rolling a number cube independent events? Why or why not?
7. Explain how to find the probability of two independent events.

Remember What You Learned

8. Look up the everyday definitions of the words *dependent* and *independent* in a dictionary. How does each definition relate to what you have learned in this lesson?

8-5**Lesson Reading Guide*****Experimental and Theoretical Probability*****Get ready for the Lesson**

Complete the Mini Lab at the top of page 436 in your textbook.

Write your answers below.

- Find the ratio $\frac{\text{number of times color was drawn}}{\text{total number of draws}}$ for each color.
- Is it possible to have a certain color marble in the bag and never draw that color?
- Open the bag and count the marbles. Find the ratio $\frac{\text{number of each color marble}}{\text{total number of marbles}}$ for each color of marble.
- Are the ratios in Exercises 1 and 3 the same? Explain.

Read the Lesson

5. The table at the right shows the results of a survey.

How many people bought balloons? _____

How many people were surveyed? _____

Item	Number of People
balloons	75
cards	15
decorations	25
cake	50

What is the experimental probability that a person surveyed preferred balloons?

6. A bag contains 15 red marbles, 25 purple marbles, and 10 yellow marbles. Describe an experiment that you could conduct with the marbles to find an experimental probability.

Remember What You Learned

7. One way to remember the difference between experimental probability and theoretical probability is to note that experimental probability is based on an experiment and theoretical probability is based on what should happen in theory. Look in a newspaper and find an example of each type of probability.

8-7**Lesson Reading Guide*****Simulations*****Get Ready for the Lesson**

Read the introduction at the top of page 445 in your textbook.

Write your answers below.

1. Determine the experimental probability of each number generated on the graphing calculator.
2. Compare the experimental probabilities found in Exercise 1 to the theoretical probabilities of rolling an actual number cube.

Read the Lesson

3. How is a simulation different from an actual event?
4. Would the experimental probability of each number change if the simulation used 100 trials instead of 50?
5. If the simulation used 10,000 trials instead of 50, would you expect the experimental probability to more closely or less closely resemble the theoretical probability?

Remember What You Learned

6. A teacher needs to choose 3 students at random from her classroom. If there are 18 students in the classroom, describe a model that could be used to simulate choosing 3 random students. Answers may vary.

8-8**Lesson Reading Guide*****Using Sampling to Predict*****Get Ready for the Lesson**

Read the instruction at the top of page 451 in your textbook.

Write your answers below.

1. Suppose she decides to survey a group of people at a basketball game. Do you think the results would represent all of the people in the viewing area? Explain.
2. Suppose she decides to survey students at your middle school. Do you think the results would represent all of the people in the viewing area? Explain.
3. Suppose she decides to call every 100th household in the telephone book. Do you think the results would represent all of the people in the viewing area? Explain.

Read the Lesson

4. What is the first step in conducting a survey?
5. When you conduct a survey by asking ten students selected at random from each grade at your school what their favorite class is, what type of random sample have you taken?
6. A grocery store owner asks the shoppers in his store where they prefer to shop for groceries. What type of sample has he conducted?

Remember What You Learned

7. Working with a partner, complete the table below with an example of each type of sample.

Type of Sample	Example
systematic random	
simple random	
stratified random	
convenience	
voluntary response	

9-2 Lesson Reading Guide

Histograms

Get Ready for the Lesson

Read the introduction at the top of page 468 in your textbook.
Write your answers below.

1. What do you notice about the price intervals in the table?
2. How many tickets were greater than \$20.00 but less than \$50.00?

Read the Lesson

3. Explain the difference between a bar graph and a histogram.
4. What does a histogram display?
5. Can the data in the table at the right be used to draw a histogram? Explain.

Eye Color in an Eighth-Grade Class		
Color	Tally	Frequency
Blue		12
Brown		9
Green		3

6. What is wrong with the histogram at the right?



Remember What You Learned

7. Work with a partner. Have one partner create a frequency table. Have the other partner draw a histogram from the table.

9-3**Lesson Reading Guide****Circle Graphs****Get Ready for the Lesson**

Read the introduction at the top of page 474 in your textbook.

Write your answers below.

1. What percent of U.S. movie-goers found a ringing cell phone the most annoying behavior at a movie theater?
2. What percent of U.S. movie-goers were annoyed with some kind of noise disturbance?
3. Which behavior was reported as most annoying?
4. Are all the behaviors surveyed accounted for in the graphic?

Read the Lesson

5. Complete the sentence: A circle graph compares _____ to the _____.
6. When drawing a circle graph from given percents, explain how the degrees for each section are determined.
7. What must you do before you can construct a circle graph for the data in the table at the right?

Favorite Shoes	
Dress	17
Sandals	21
Sneakers	42

Remember What You Learned

8. Can the data in the table at the right be used to make a circle graph? Explain. What must be true of the percents used to make a circle graph?

Color of T-Shirt Worn	
Blue	32%
Red	19%
Gray	6%

9-4**Lesson Reading Guide*****Measures of Central Tendency and Range*****Get Ready for the Lesson**

Read the introduction at the top of page 483 in your textbook.

Write your answers below.

1. What is the *average* number of days for these nine countries?
2. Order the numbers from least to greatest. What is the middle number in your list?
3. What number(s) appear more than once?
4. Which of the number or numbers from Questions 1–3 might be representative of the data? Explain.

Read the Lesson

5. Name the most common measures of central tendency.
6. Explain in your own words how to find the mean of a data set.
7. When finding the median, what first must be done to the set of data?

Remember What You Learned

8. Think about the hours of television you have watched each day in the past week. List the times, and find their mean, median, mode, and range. Which measure of central tendency best represents the data? Compare your findings with your classmates.

9-5**Lesson Reading Guide*****Measures of Variation*****Get Ready for the Lesson**

Read the introduction at the top of page 491 in your textbook.

Write your answers below.

1. Find the median of the data.
2. Organize the data into five groups of equal size. How many data values are in each group?
3. What fraction of the entire data is in each group? What percent?
4. What fraction of the data is below the median? Above the median?
5. Find the range of the data.
6. What does the range tell you about the data of the average number of hours teens spend online each week?

Read the Lesson

7. When given a set of data, explain how to find the range.
8. What is the interquartile range?
9. Describe the steps for finding the limits for outliers of a set of data.

Remember What You Learned

10. Explain how the words *quarter* and *quartile* are similar. Explain how they are different.

9-6**Lesson Reading Guide*****Box-and-Whisker Plots*****Get Ready for the Lesson**

Read the introduction at the top of page 497 in your textbook.

Write your answers below.

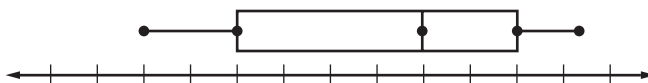
1. What is the least value in the data?
2. What is the lower quartile of the data?
3. What is the median of the data?
4. What is the upper quartile of the data?
5. What is the greatest value in the data?
6. Name any outliers.

Read the Lesson

7. Explain the parts of the box-and-whisker plot in your own words.
8. Complete the sentence: A box-and-whisker plot separates a set of data into _____ parts, each containing _____ of the data.
9. What does the length of a whisker tell you about the data?

Remember What You Learned

10. What five key numbers are necessary to construct a box-and-whisker plot? Identify the point corresponding to each of these numbers on the graph below.



9-7**Lesson Reading Guide*****Select an Appropriate Display*****Get Ready for the Lesson**

Read the introduction at the top of page 504 in your textbook.

Write your answers below.

1. Which display(s) show the interval of test scores for half the class?
2. Which display(s) allow you to find the score for a specific student?

Read the Lesson

3. Name three different ways to display data.
4. What two questions should you ask yourself when determining which type of display to use?

Remember What You Learned

Choose the letter that best matches the type of display to its use.

- | | |
|------------------------|---|
| 5. Circle Graph | a. shows the frequency of data that has been organized into equal intervals |
| 6. Line Graph | b. lists all individual numerical data in a condensed form |
| 7. Bar Graph | c. shows the number of items in specific categories in the data using bars |
| 8. Histogram | d. compares part to a whole |
| 9. Line Plot | e. shows change over a period of time |
| 10. Stem-and-Leaf Plot | f. shows how many times each number occurs in the data |

9-8**Lesson Reading Guide*****Misleading Graphs and Statistics*****Get Ready for the Lesson**

Read the introduction at the top of page 509 in your textbook.

Write your answers below.

1. Do both graphs show the same data?
2. Which graph seems to show the greater increase in spending? Why?

Read the Lesson

3. Give an example of how a graph could be misleading.
4. When writing an employment ad for an automotive dealership, would it be best to use the mean, median, or mode of the number of cars sold to encourage a commissioned salesperson to apply for the job?

Wagner Automotive Sales			
Month	Number of Cars Sold	Month	Number of Cars Sold
January	16	July	44
February	5	August	40
March	34	September	38
April	49	October	45
May	47	November	48
June	79	December	38

Remember What You Learned

5. Work with a partner. Have your partner draw a set of graphs that are misleading. Tell your partner what makes the graphs misleading and redraw them to accurately display the data.

10-1**Lesson Reading Guide*****Simplifying Algebraic Expressions*****Get Ready for the Lesson**

Do the Mini Lab at the top of page 528 in your textbook. Write your answers below.

1. Choose two positive and one negative value for x . Then evaluate $2(x + 3)$ and $2x + 6$ for each of these values. What do you notice?
2. Use algebra tiles to rewrite the expression $3(x - 2)$. (*Hint:* Use one green x -tile and 2 red -1 -tiles to represent $x - 2$.)

Read the Lesson

3. When is the Distributive Property used to simplify an algebraic expression?
4. Explain how to simplify the expression $5(x - 3)$.
5. Explain what it means for two expressions to be equivalent.
6. Give an example of an expression containing three terms, one of which is a constant.

Remember What You Learned

7. One of your classmates was absent from school today and has not studied the lesson. Write a letter to your classmate explaining how to simplify an expression and how to identify terms and constants.

10-2**Lesson Reading Guide*****Solving Two-Step Equations*****Get Ready for the Lesson**

Read the introduction at the top of page 534 in your textbook.

Write your answers below.

1. Explain how you could use the work backward strategy to find the cost of each hardback book. Then find the cost.

Read the Lesson

2. Define *two-step equation*.

Determine whether each equation is a two-step equation. Explain.

3. $n + 8 = 21$

4. $2x + 1 = 15$

5. $\frac{c}{4} = 6.5$

What is the first step in solving each equation?

6. $3y - 2 = 16$

7. $5 - 6x = -19$

8. $-2p + 11 = 7$

Remember What You Learned

9. Draw a diagram that shows how the equation $2x + 3 = 8$ can be modeled using algebra tiles.

10-3**Lesson Reading Guide*****Writing Two-Step Equations*****Get Ready for the Lesson**

Read the introduction at the top of page 539 in your textbook.

Write your answers below.

1. Let n represent the number of payments. Write an expression that represents the amount of the loan paid after n payments.
2. Write and solve an equation to find the number of payments you will have to make in order to pay off your loan.
3. What type of equation did you write for Exercise 2? Explain your reasoning.

Read the Lesson

Jennifer bought 3 CDs, each having the same price. Her total for the purchase was \$51.84, which includes \$3.84 in sales tax. Find the price of each CD.

4. Explain how to define the variable in the problem. Then define the variable.
5. The next step is to write an equation for the problem. Assuming that the total, 51.84, will be on the right side of the equals sign by itself, determine which two operations will be represented on the left side of the equals sign. Which is performed first? Explain.
6. Complete the equation. Then solve it. How much does each CD cost?
_____ = \$51.84

Remember What You Learned

7. Work with a partner. Have one partner write a word problem that involves a two-step equation and solve it. Have the other partner check the solution. Then have partners switch tasks.

10-4**Lesson Reading Guide*****Sequences*****Get Ready for the Lesson**

Complete the Mini Lab at the top of page 544 in your textbook.

Write your answers below.

1. Continue the pattern for 4, 5, and 6 triangles. How many toothpicks are needed for each case?
2. How many additional toothpicks are needed for 4 triangles? How many total toothpicks will you need for 7 triangles?

Read the Lesson

3. Explain how to determine whether a sequence is arithmetic.
4. State whether the sequence 4, 6, 9, 13, 18, . . . is arithmetic. Explain.
5. State whether the sequence 2, 6, 18, 54, 162, . . . is arithmetic. Explain.

Remember What You Learned

6. Work with a partner. Have one partner write three sequences of numbers. Have the other partner state whether the sequence is arithmetic, and if so, state the common difference and the next three terms.

10-5 Lesson Reading Guide***Solving Equations with Variables on Each Side*****Get Ready for the Lesson**

Read the introduction at the top of page 553 in your textbook.

Write your answers below.

- Use the table. Continue filling in rows to find how long it will take you to catch up to your friend.
- Write an expression for your distance after x seconds.
- Write an expression for your friend's distance after x seconds.
- What is true about the distances you and your friend have gone when you catch up to your friend?
- Write an equation that could be used to find how long it will take for you to catch up to your friend.

Time (s)	Friend's Distance (m)	Your Distance (m)
0	$15 + 5(0) = 15$	$6(0) = 0$
1	$15 + 5(1) = 20$	$6(1) = 6$
2	$15 + 5(2) = 25$	$6(2) = 12$
3	$15 + 5(3) = 30$	$6(3) = 18$

Read the Lesson

- What is the first step in solving an equation with variables on each side?
- What does it mean to *isolate* the variable when solving an equation?

Determine whether the variable is isolated in each equation. Then determine whether the equation is solved for the variable.

8. $c = 8$

9. $3x + 1 = 7$

10. $5d = 15$

Remember What You Learned

- Create a general set of guidelines to solve any type of equation.

10-7 Lesson Reading Guide***Inequalities*****Get Ready for the Lesson**

Read the introduction at the top of page 559 in your textbook.

Write your answers below.

1. Name three truck heights that can safely pass on a road where the first sign is posted. Can a truck that is 10 feet 6 inches tall pass? Explain.
2. Name three speeds that are legal according to the second sign. Is a car traveling at 45 miles per hour driving at a legal speed? Explain.

Read the Lesson

3. Complete the table by providing the symbol used to represent each phrase.

Phrase	Symbol	Phrase	Symbol
is greater than		is at most	
is at least		exceeds	
is fewer than		is less than or equal to	
is more than		is no less than	

4. Explain the difference between an open and a closed circle on the graph of an inequality.
5. What does the arrow to the right or to the left indicate on the graph of an inequality?
6. Describe how to graph $x > 7$.
7. Describe how to graph $x \leq -6$.

Remember What You Learned

8. Use a newspaper to find real-world situations in which relationships between quantities are described by phrases like *no more than*, *at least*, *greater than*, and *at most*.

11-1**Lesson Reading Guide*****Functions*****Get Ready for the Lesson**

Read the introduction at the top of page 572 in your textbook.

Write your answers below.

1. Complete the table at the right.
2. If 6 DVDs are purchased, what is the total cost?
3. Explain how to find the total cost of 9 DVDs.

DVDs	Cost (\$)
1	15
2	30
3	
4	
5	

Read the Lesson

4. If $f(x) = x + 5$, explain how to find $f(2)$. Then find $f(2)$.
5. Identify the input value and the output value in Exercise 4.
6. Define *domain*. What number in Exercise 4 is part of the domain?
7. Explain why the output value is called the dependent variable. What represents the dependent variable in the function $f(x) = x + 5$?

Remember What You Learned

8. When looking at the word *domain*, you see the word *in* located at the end of the word. This is a way to remember that the domain is the set of *input* values. Find a way to remember that the range is the set of output values.

11-2**Lesson Reading Guide****Representing Linear Functions****Get Ready for the Lesson**

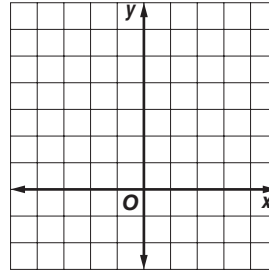
Read the introduction at the top of page 579 in your textbook. Write your answers below.

1. Complete the following function table.

Input x	Rule $1.5x$	Output y	(Input, Output) (x, y)
1	$1.5(1)$	1.5	(1, 1.5)
2	$1.5(2)$		
3			
4			

2. Graph the ordered pairs on a coordinate plane.

3. What do you notice about the points on your graph?

**Read the Lesson**

4. In your own words, explain how to graph a function.
5. Explain how to find the x -intercept of the graph of a linear function. Then find the x -intercept of $y = 2x + 8$.
6. Explain how to find the y -intercept of the graph of a linear function. Then find the y -intercept of $y = 2x + 8$.

Remember What You Learned

7. Think of a gas pump with prices for regular and super gasoline. When the same amount of gas is being pumped into a tank, how does the price per gallon affect the total cost of the gas?

11-3**Lesson Reading Guide*****Slope*****Get Ready for the Lesson**

Do the Mini Lab at the top of page 585 in your textbook. Write your answers below.

1. The rate of change of the ladder compares the height it is raised to the distance of its base from the building. Write this rate as a fraction in simplest form.
2. Find the rate of change of a ladder that has been raised 100 feet and whose base is 50 feet from the building.

Read the Lesson

3. A line passes through the points $A(-1, -5)$, $B(0, -1)$, $C(1, 3)$, and $D(2, 7)$. Does it matter which two points you use to find the slope using the slope formula? Explain.
4. Suppose you choose to find the slope of the line in Exercise 3 using points $C(1, 3)$ and $D(2, 7)$. If your numerator after substitution into the slope formula is $3 - 7$, what should be your denominator? Explain.
5. Explain the difference between $\frac{0}{3}$ and $\frac{3}{0}$.

Remember What You Learned

6. Fill in the table with the appropriate term, *positive* or *negative*.

Translating Rise and Run	Slope
up	
left	
down	
right	

11-4**Lesson Reading Guide*****Direct Variation*****Get Ready for the Lesson**

Read the introduction at the top of page 591 in your textbook.

1. What is the constant rate of change, or slope, of the line?
2. Is the total number of pages printed always proportional to the printing time? If so, what is the constant ratio?
3. Compare the constant rate of change to the constant ratio.

Read the Lesson

4. How much does the number of pages change for each interval on the graph?
5. Does the number of pages change by the same amount for each interval on the graph? If not, by how much does it change for each interval?
6. Why might a graph need to use a different interval for the y -axis and x -axis?

Remember What You Learned

7. A graph of Jesse's earnings has an interval of \$5 for the y -axis and an interval of 1 hour for the x -axis. A point on the graph shows that he earns \$30 in 2 hours. The amount that he earns varies directly as the time he works. What is the constant ratio?

11-5 Lesson Reading Guide***Slope-Intercept Form*****Get Ready for the Lesson**

Complete the Mini Lab at the top of page 599 in your textbook. Write your answers below.

1. Use the graphs of the equations to find the slope and y -intercept of each line. Complete the table.

Equation	Slope	y -intercept
$y = 3x + 2$		
$y = \frac{1}{4}x + (-1)$		
$y = -2x + 3$		

2. Compare each equation with the value of its slope and its y -intercept. What do you notice?

Read the Lesson

3. In the formula $y = mx + b$, what do the letters m and b represent?

Identify the slope and the y -intercept of the graph of each equation.

4. $y = -3x + 4$

5. $y = \frac{2}{3}x - 7$

6. How can you find the slope and the y -intercept of the graph of $x + y = 8$?

7. If you know the y -intercept of a line is 4 and that the slope is $-\frac{3}{2}$, how do you graph the line?

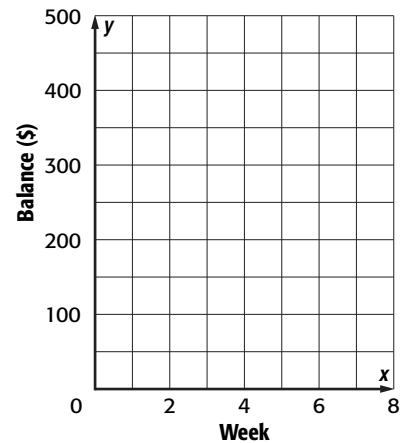
Remember What You Learned

8. Work with a partner. Using a coordinate grid, take turns graphing lines and identifying the slope and y -intercept of each graph.

11-6 Lesson Reading Guide**Writing Linear Equations****Get Ready for the Lesson**

Read the introduction at the top of page 606 in your textbook. Write your answers below.

- Graph the ordered pairs (week, balance). Then draw a line through the points.
- Find the slope and the y -intercept of the line. What do these values represent?
- Write an equation in the form $y = mx + b$ for the line.

**Read the Lesson**

- What does the variable m represent in a linear equation?
- What does the variable b represent in a linear equation?
- What would the slope and y -intercept be for the equation $y = x$?

Remember What You Learned

- A line has points at $(0, 50)$ and $(4, 70)$. What are the slope and y -intercept of the line? Write an equation in the form $y = mx + b$ for the line.

11-8 Lesson Reading Guide***Scatter Plots*****Get Ready for the Lesson**

Complete the Mini Lab at the top of page 613 in your textbook.

Write your answers below.

1. Graph each of the ordered pairs listed on the board.
2. Examine the graph. Do you think there is a relationship between height and arm span? Explain.

Read the Lesson

3. How is a scatter plot different from the graph of a linear function?
4. What pattern would you expect to see in a scatter plot that shows a positive relationship?
5. What pattern would you expect to see in a scatter plot that shows a negative relationship?
6. Would you expect a scatter plot to show a *positive*, *negative*, or *no* relationship between the population of a state and its number of representatives in the U.S. Congress? Explain.

Remember What You Learned

7. Using a newspaper or magazine, find an article with data given. Plot the data on a coordinate plane and identify whether the data has a *positive*, *negative*, or *no* relationship.

12-1**Lesson Reading Guide*****Linear and Nonlinear Functions*****Get Ready for the Lesson**

Read the introduction at the top of page 630 in your textbook.

Write your answers below.

1. During its ascent, did the rocket travel the same distance each second?
Justify your answer.
2. During its descent, did the rocket travel the same distance each second?
Justify your answer.
3. Graph the ordered pairs (time, height) for the rocket's ascent and descent on separate axes. Connect the points with a straight line or smooth curve. Then compare the graphs.

Read the Lesson

4. How does the rate of change of a nonlinear function differ from the rate of change of a linear function?
5. Determine whether the table represents a linear or nonlinear function. Explain.

x	3	7	11	15
y	46	35	24	13

6. How can you distinguish the equations of linear functions from the equations of nonlinear functions?

Remember What You Learned

7. Using a newspaper or magazine, find one example of a linear graph and one example of a nonlinear graph.

12-2**Lesson Reading Guide****Graphing Quadratic Functions****Get Ready for the Lesson**

Complete the Mini Lab at the top of page 637 in your textbook.

Write your answers below.

1. Is the relationship between the side length and the area of a square linear or nonlinear? Explain.
2. Describe the shape of the graph.

Read the Lesson

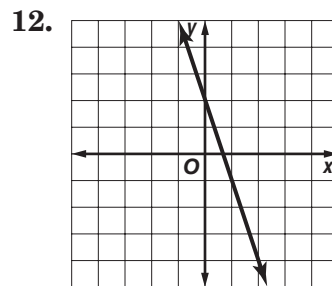
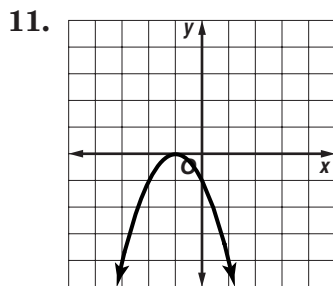
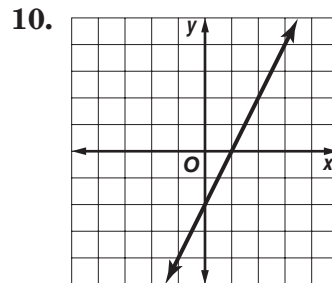
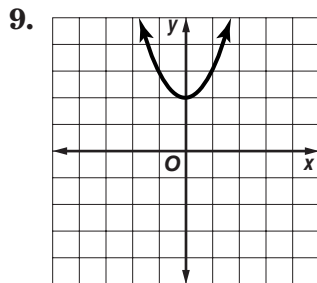
3. How can you distinguish the equations of quadratic functions from the equations of other functions?

Determine whether each equation represents a quadratic function.

4. $y = 3x - 5$
5. $y = 6 - x^2$
6. $y = x^3 + 2$
7. $y = \frac{8}{x}$

8. Describe the shape of the graph of a quadratic function. What is this shape called?

Determine whether each graph represents a quadratic function.

**Remember What you Learned**

13. Work with a partner. Have your partner write a quadratic equation. Then you create a table of values and graph the equation. After a few equations have been completed, switch roles.

12-3**Lesson Reading Guide*****Simplifying Polynomials*****Get Ready for the Lesson**

Read the introduction at the top of page 642 in your textbook.

Write your answers below.

1. Let q , d , n , and p represent the value of a quarter, a dime, a nickel, and a penny, respectively. Write an expression for the total amount of money in your backpack.
2. Write an expression for the total amount of money in your pocket.
3. Write an expression for the total amount of money in all.

Read the Lesson

4. What is a monomial?

Determine whether each expression is a monomial. Explain.

5. 8

6. y

7. $3c^2$

8. $x + 2$

9. Explain what is meant by *like terms*.

Determine whether the expressions are like terms. Explain.

10. $d, 6$

11. c^3, c

12. $2m^2, 3m^2$

13. $2x^2, 2y^2$

14. Read the Study Tip on page 571 in your textbook. Describe the customary way to write a polynomial in simplified form. What is it called? Which of the polynomials $1 + 2x + x^2$, $2x^3 + 5x^2 + x - 6$, and $6x + x + 3x^3 + 1$ is written in this customary way?

Remember What You Learned

15. Work with a partner. Make up a silly statement involving polynomials. For example, *7 apples plus 4 bananas plus 2 apples*. Have your partner write a polynomial to represent the statement and then simplify it. Repeat with your partner making up a silly statement.

12-4 Lesson Reading Guide***Adding Polynomials*****Get Ready for the Lesson**

Complete the Mini Lab at the top of page 646 in your textbook.
Write your answers below.

- Write the polynomial for the tiles that remain.
- Use algebra tiles to find $(x^2 + x - 2) + (6x^2 - 5x - 1)$.

Read the Lesson

- When adding two polynomials vertically, how should the terms be arranged?

Determine whether each vertical addition can be performed as written. Explain.

$$\begin{array}{r} 4. \quad x^2 + 5x - 6 \\ (+) 2x^2 + 3x + 4 \end{array}$$

$$\begin{array}{r} 5. \quad x^2 + 6 \\ (+) 2x^2 - x \end{array}$$

Rewrite each sum of polynomials vertically. Then add.

$$6. (3d^2 + 14d - 2) + (-d^2 + 3d + 5) \qquad 7. (2n^2 + 3) + (n^2 - 5n + 1)$$

Remember What You Learned

- Given the problem $(3x^2 + 5x - 9) + (x^2 + 2x + 7)$, color code each like term with a different colored pencil. If there are any missing terms, place a box in its space. Then make up your own problem and color code it. Combine the terms with the same color.

12-5**Lesson Reading Guide*****Subtracting Polynomials*****Get Ready for the Lesson**

Complete the Mini Lab at the top of page 651 in your textbook.

Write your answers below.

1. From the tiles that remain, determine the value of $(x + 4) - (-2x + 3)$.
2. Use algebra tiles to find $(2x^2 + 3x + 5) - (x^2 - x + 2)$.

Read the Lesson

3. What is the additive inverse of a number or expression?
4. How is the additive inverse related to subtraction of polynomials?

Rewrite each difference of polynomials as a sum of polynomials. Then add.

5. $(7x + 5) - (4x - 3)$
6. $(-3c^2 + 2c - 1) - (-c^2 - c - 2)$
7. $(m^2 + 3m - 6) - (m^2 + 1)$
8. $(-6s + 9) - (4s^2 + 2s - 3)$

Remember What You Learned

9. Using a dictionary, look up other words containing the prefixes *mono*, *bi*, and *poly*. Give an example of a word containing each prefix and explain how it relates to the lesson.

12-6**Lesson Reading Guide*****Multiplying and Dividing Monomials*****Get Ready for the Lesson**

Read the introduction at the top of page 655 in your textbook.

Write your answers below.

1. Examine the exponents of the factors and the exponents of the products in the last column. What do you observe?

Read the Lesson

2. Under what condition can you multiply two powers by adding their exponents?

Determine whether each multiplication can be performed by adding exponents. Explain.

3. $6^5 \cdot 6^3$

4. $c^2 \cdot c^{10}$

5. $m^3 \cdot n^2$

6. Under what condition can you divide two powers by subtracting their exponents?

Determine whether each division can be performed by subtracting exponents. Explain.

7. $\frac{8^3}{4^2}$

8. $\frac{a^3}{b^3}$

9. $\frac{z^6}{z^5}$

10. Explain how to multiply $(6x^3)(-3x^2)$. Then find the product.

Remember What You Learned

11. Explain in your own words the Product of Powers Property and Quotient of Powers Property. Be sure to include an example of each property in your explanation.

12-8**Lesson Reading Guide*****Multiplying Monomials and Polynomials*****Get Ready for the Lesson**

Complete the Mini Lab at the top of page 661 in your textbook.
Write your answers below.

1. What is $x(x + 3)$ in simplest form?

Use algebra tiles to find each product.

2. $x(x + 4)$

3. $x(3x + 1)$

4. $2x(x + 3)$

Read the Lesson

5. Explain how to multiply a polynomial by a monomial.

6. Explain what is done at each step in the following problem.

$$3x(x^2 + 5x - 2)$$

$$= 3x[x^2 + 5x + (-2)]$$

$$= 3x(x^2) + 3x(5x) + 3x(-2)$$

$$= 3x^3 + 15x^2 + (-6x)$$

$$= 3x^3 + 15x^2 - 6x$$

7. Give an example from Exercise 6 where the Products of Powers rule is used.

Remember What You Learned

8. One way to help you remember to multiply all the terms when multiplying a monomial by a polynomial is to draw arrows from each term outside the parenthesis to each term inside the parenthesis.

$$3x(x + 4)$$

$$(5x - 7)(3)$$

Work a problem using arrows and without using arrows. Did you get the same solution? Explain how drawing arrows to the terms is a help.