

# Holt Algebra 1

## Homework and Practice Workbook



**HOLT, RINEHART AND WINSTON**

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## LESSON

**1-1****Practice B*****Variables and Expressions***

Give two ways to write each algebraic expression in words.

1.  $15 - b$

\_\_\_\_\_

\_\_\_\_\_

2.  $\frac{x}{16}$

\_\_\_\_\_

\_\_\_\_\_

3.  $x + 9$

\_\_\_\_\_

\_\_\_\_\_

4.  $(2)(t)$

\_\_\_\_\_

\_\_\_\_\_

5.  $z - 7$

\_\_\_\_\_

\_\_\_\_\_

6.  $4y$

\_\_\_\_\_

\_\_\_\_\_

7. Sophie's math class has 6 fewer boys than girls, and there are  $g$  girls. Write an expression for the number of boys.

\_\_\_\_\_

8. A computer printer can print 10 pages per minute. Write an expression for the number of pages the printer can print in  $m$  minutes.

\_\_\_\_\_

Evaluate each expression for  $r = 8$ ,  $s = 2$ , and  $t = 5$ .

9.  $st$

\_\_\_\_\_

10.  $r \div s$

\_\_\_\_\_

11.  $s + t$

\_\_\_\_\_

12.  $r - t$

\_\_\_\_\_

13.  $r \cdot s$

\_\_\_\_\_

14.  $t - s$

\_\_\_\_\_

15. Paula always withdraws 20 dollars more than she needs from the bank.

a. Write an expression for the amount of money Paula withdraws if she needs  $d$  dollars.

\_\_\_\_\_

b. Find the amount of money Paula withdraws if she needs 20, 60, and 75 dollars.

\_\_\_\_\_

## LESSON

**Practice B****1-2*****Adding and Subtracting Real Numbers***

Add or subtract using a number line.

1.  $-6 + (-8)$   
\_\_\_\_\_

2.  $2 - (-8)$   
\_\_\_\_\_

3.  $10 + (-4) =$   
\_\_\_\_\_

4.  $-2 - (-6)$   
\_\_\_\_\_

5.  $-7 + 7$   
\_\_\_\_\_

6.  $-0.25 - 4$   
\_\_\_\_\_

Add.

7.  $-5 + 23$   
\_\_\_\_\_

8.  $-15 + (-9)$   
\_\_\_\_\_

9.  $24.6 + (-45.5)$   
\_\_\_\_\_

10.  $-\frac{3}{8} + 5$   
\_\_\_\_\_

11.  $a + (-14)$  for  $a = 16$   
\_\_\_\_\_

12.  $-3.3 + x$  for  $x = -9.1$   
\_\_\_\_\_

Subtract.

13.  $-35 - (-80)$   
\_\_\_\_\_

14.  $12 - (-16)$   
\_\_\_\_\_

15.  $8.3 - 10.7$   
\_\_\_\_\_

16.  $-\frac{2}{3} - 5\frac{1}{3}$   
\_\_\_\_\_

17.  $15 - t$  for  $t = -22$   
\_\_\_\_\_

18.  $z - 3.5$  for  $z = 1$   
\_\_\_\_\_

19. The record high temperature for Asheville, North Carolina was  $99^{\circ}\text{F}$ . The record low was  $-17^{\circ}\text{F}$ . What is the difference between these two temperatures?  
\_\_\_\_\_

20. The balance in Mr. Sanchez's bank account was  $\$293.74$ . He accidentally wrote a check for  $\$300$ . What is his balance now?  
\_\_\_\_\_

Evaluate the expression  $18 - n$  for each value of  $n$ .

21.  $n = -13$   
\_\_\_\_\_

22.  $n = 8.55$   
\_\_\_\_\_

23.  $n = 20\frac{1}{5}$   
\_\_\_\_\_

## LESSON

**Practice B****1-3*****Multiplying and Dividing Real Numbers***

Find the value of each expression.

1.  $-24 \div -8$

\_\_\_\_\_

2.  $24(-5)$

\_\_\_\_\_

3.  $-96 \div 3$

\_\_\_\_\_

4.  $-6(20)$

\_\_\_\_\_

5.  $-7p$  for  $p = -15$

\_\_\_\_\_

6.  $t \div (-1.5)$  for  $t = 6$

\_\_\_\_\_

Divide.

7.  $-\frac{8}{9} \div \frac{2}{3}$

\_\_\_\_\_

8.  $-12 \div \left(-\frac{6}{25}\right)$

\_\_\_\_\_

9.  $2\frac{1}{4} \div \left(-5\frac{1}{3}\right)$

\_\_\_\_\_

Multiply or divide.

10.  $0 \cdot 4.75$

\_\_\_\_\_

11.  $0 \div 10$

\_\_\_\_\_

12.  $-\frac{1}{3} \div 0$

\_\_\_\_\_

13. When Brianna's first CD sold a million copies, her record label gave her a \$5000 bonus. She split the money evenly between herself, her agent, her producer, and her stylist. How much money did each person receive?

\_\_\_\_\_

14.  $(0.3)(-1.8)$

\_\_\_\_\_

15.  $\frac{2}{5} \left(-\frac{5}{2}\right)$

\_\_\_\_\_

16.  $-15 \div (-6)$

\_\_\_\_\_

Evaluate each expression for  $x = 16$ ,  $y = -4$ , and  $z = -2$ .

17.  $y \div x$

\_\_\_\_\_

18.  $x \cdot y$

\_\_\_\_\_

19.  $xz$

\_\_\_\_\_

20.  $z \div y$

\_\_\_\_\_

21.  $(y)(z)$

\_\_\_\_\_

22.  $y \div z$

\_\_\_\_\_

23.  $x \div z$

\_\_\_\_\_

24.  $x \div y$

\_\_\_\_\_

25.  $z \div x$

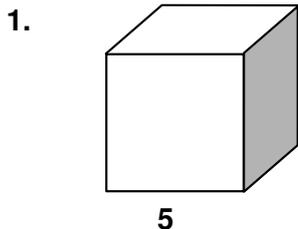
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**LESSON**

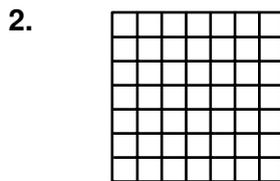
**Practice B**

**1-4 Powers and Exponents**

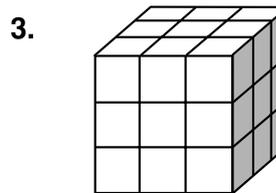
Write the power represented by each geometric model.



\_\_\_\_\_



\_\_\_\_\_



\_\_\_\_\_

Evaluate each expression.

4.  $2^4$

\_\_\_\_\_

5.  $(-3)^3$

\_\_\_\_\_

6.  $\left(\frac{2}{5}\right)^2$

\_\_\_\_\_

7.  $3^5$

\_\_\_\_\_

8.  $(-10)^4$

\_\_\_\_\_

9.  $\left(\frac{3}{4}\right)^2$

\_\_\_\_\_

Write each number as a power of the given base.

10. 16; base 2

\_\_\_\_\_

11. 1,000,000; base 10

\_\_\_\_\_

12. -216; base -6

\_\_\_\_\_

13. 2401; base 7

\_\_\_\_\_

14. 256; base -4

\_\_\_\_\_

15.  $\frac{8}{27}$ ; base  $\frac{2}{3}$

\_\_\_\_\_

16. Anna needed to let everyone in the music club know the time of its next meeting. She called two people and asked each of them to call two other people, and so on. If each phone call takes one minute, how many phone calls were made during the fifth minute?

\_\_\_\_\_

**LESSON**  
**1-5** **Practice B**  
**Square Roots and Real Numbers**

Find each square root.

1.  $\sqrt{144}$

\_\_\_\_\_

2.  $-\sqrt{36}$

\_\_\_\_\_

3.  $\sqrt{\frac{1}{49}}$

\_\_\_\_\_

4.  $\sqrt{196}$

\_\_\_\_\_

5.  $-\sqrt{64}$

\_\_\_\_\_

6.  $-\sqrt{\frac{4}{25}}$

\_\_\_\_\_

7. A contractor needs to cut a piece of glass to fit a square window. The area of the window is  $12 \text{ ft}^2$ . Find the length of the side of the window to the nearest tenth of a foot.

\_\_\_\_\_

8. A piece of cloth must be cut to exactly cover a square table. The area of the table is  $27 \text{ ft}^2$ . Find the length of the side of the table to the nearest tenth of a foot.

\_\_\_\_\_

Write all the classifications that apply to each real number.

9.  $\sqrt{2}$

\_\_\_\_\_  
 \_\_\_\_\_

10.  $\frac{2}{3}$

\_\_\_\_\_  
 \_\_\_\_\_

11.  $-10$

\_\_\_\_\_  
 \_\_\_\_\_

12.  $\sqrt{81}$

\_\_\_\_\_  
 \_\_\_\_\_

13.  $0$

\_\_\_\_\_  
 \_\_\_\_\_

14.  $1$

\_\_\_\_\_  
 \_\_\_\_\_

## LESSON

**Practice B****1-6** *Order of Operations*

Simplify each expression.

1.  $18 - 12 + 4^2$

\_\_\_\_\_

2.  $5 \cdot 3 + 2(4)$

\_\_\_\_\_

3.  $-2[7 + 6(3 - 5)]$

\_\_\_\_\_

4.  $-7 - (2^4 \div 8)$

\_\_\_\_\_

5.  $-6 \cdot 3 + |-3(-4 + 2^3)|$

\_\_\_\_\_

6.  $\frac{-16 + 4}{2(\sqrt{13} - 4)}$

\_\_\_\_\_

Evaluate each expression for the given value of the variable.

7.  $3 - y^2 + 7$  for  $y = 5$

\_\_\_\_\_

8.  $-3(x + 12 \cdot 2)$  for  $x = -8$

\_\_\_\_\_

9.  $(m + 6) \div (2 - 5)$  for  $m = 9$

\_\_\_\_\_

10.  $-5t + 12 - \frac{1}{2}t$  for  $t = -10$

\_\_\_\_\_

Translate each word phrase into a numerical or algebraic expression.

11. the product of 6 and the sum of 3 and 20

\_\_\_\_\_

12. the absolute value of the difference of  $m$  and  $-15$ 

\_\_\_\_\_

13. the quotient of  $-18$  and the sum of  $-2$  and  $d$ 

\_\_\_\_\_

Degrees Fahrenheit  $F$  can be converted to degrees Celsius  $C$  using the expression  $\frac{5}{9}(F - 32)$ . Degrees Celsius can be converted to degrees Fahrenheit using the expression  $\frac{9}{5}C + 32$ .

14. The hottest recorded day in Florida history was  $109^\circ F$ , which occurred on June 29, 1931 in Monticello. Convert this temperature to degrees Celsius. Round your answer to the nearest tenth of a degree.

\_\_\_\_\_

15. The coldest recorded day in Florida history was about  $-18.9^\circ C$ , which occurred on February 13, 1899 in the city of Tallahassee. Convert this temperature to degrees Fahrenheit. Round your answer to the nearest tenth of a degree.

\_\_\_\_\_

**LESSON**  
**1-7**

**Practice B**  
**Simplifying Expressions**

Simplify each expression.

1.  $18 + 9 + 1 + 12$

\_\_\_\_\_

2.  $7 \cdot 15 \cdot 2$

\_\_\_\_\_

3.  $3 + 4\frac{1}{2} + 11 + 5\frac{1}{2}$

\_\_\_\_\_

4.  $-5 \cdot 7 \cdot 20$

\_\_\_\_\_

5.  $-12 + 3 + 12 + 19$

\_\_\_\_\_

6.  $-1 \cdot 5 \cdot 9 \cdot 2$

\_\_\_\_\_

Write each product using the Distributive Property. Then simplify.

7.  $14(12)$

\_\_\_\_\_  
\_\_\_\_\_

8.  $5(47)$

\_\_\_\_\_  
\_\_\_\_\_

9.  $4(106)$

\_\_\_\_\_  
\_\_\_\_\_

Simplify each expression by combining like terms.

10.  $16x + 27x$

\_\_\_\_\_

11.  $-4m + 12m$

\_\_\_\_\_

12.  $6t^2 - 2t^2$

\_\_\_\_\_

13.  $-5w^3 + 18w^3$

\_\_\_\_\_

14.  $4p + 7p^2$

\_\_\_\_\_

15.  $-2.6d - 3.4d$

\_\_\_\_\_

Simplify each expression. Justify each step.

16.  $4(x + 9) + 5x$

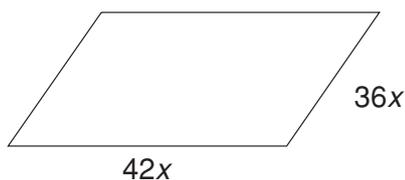
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

17.  $-12d + 3 + 14d + 18$

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

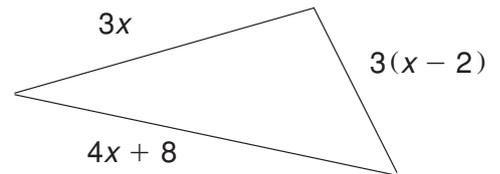
Give an expression in simplified form for the perimeter of each figure.

18.



\_\_\_\_\_

19.

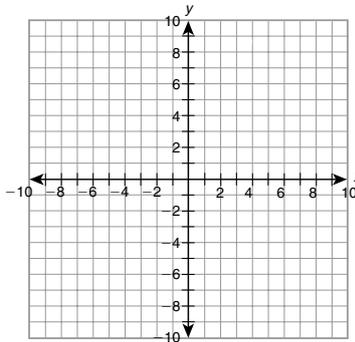


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**LESSON** **Practice B**  
**1-8** *Introduction to Functions*

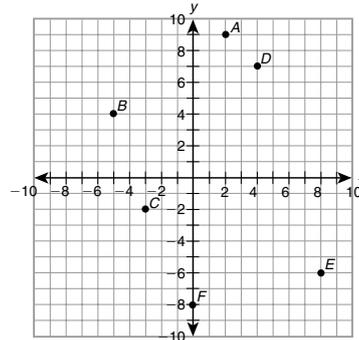
Graph each point.

- 1.  $G(2, 2)$
- 2.  $M(3, 8)$
- 3.  $X(4, -7)$
- 4.  $L(-6, -1)$
- 5.  $K(8, 0)$
- 6.  $T(-2, 5)$



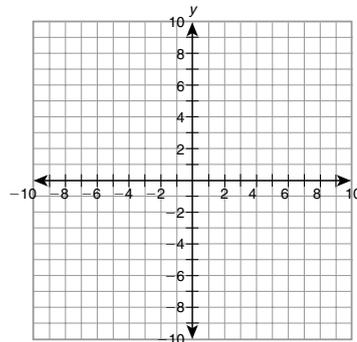
Name the quadrant in which each point lies.

- 7.  $A$  \_\_\_\_\_
- 8.  $B$  \_\_\_\_\_
- 9.  $C$  \_\_\_\_\_
- 10.  $D$  \_\_\_\_\_
- 11.  $E$  \_\_\_\_\_
- 12.  $F$  \_\_\_\_\_



13. Generate ordered pairs for  $y = |x - 4|$  using  $x = 2, 3, 4, 5$  and  $6$ .  
 Graph the ordered pairs and describe the pattern.

Input	Output	Ordered Pair
$x$	$y$	$(x, y)$



14. The number of chaperones at a school field trip must be  $\frac{1}{5}$  the number of students attending, plus the 2 teacher sponsors. Write a rule for the number of chaperones that must be on the trip. Write ordered pairs to represent the number of chaperones that must attend the trip when there are 120, 150, 200, and 210 students.

## LESSON

**Practice B****2-1****Solving Equations by Adding or Subtracting**

Solve each equation. Check your answers.

1.  $g - 7 = 15$

\_\_\_\_\_

2.  $t + 4 = 6$

\_\_\_\_\_

3.  $13 = m - 7$

\_\_\_\_\_

4.  $x + 3.4 = 9.1$

\_\_\_\_\_

5.  $n - \frac{3}{8} = \frac{1}{8}$

\_\_\_\_\_

6.  $p - \frac{1}{3} = \frac{2}{3}$

\_\_\_\_\_

7.  $-6 + k = 32$

\_\_\_\_\_

8.  $7 = w + 9.3$

\_\_\_\_\_

9.  $8 = r + 12$

\_\_\_\_\_

10.  $y - 57 = -40$

\_\_\_\_\_

11.  $-5.1 + b = -7.1$

\_\_\_\_\_

12.  $a + 15 = 15$

\_\_\_\_\_

13. Marietta was given a raise of \$0.75 an hour, which brought her hourly wage to \$12.25. Write and solve an equation to determine Marietta's hourly wage before her raise. Show that your answer is reasonable.

\_\_\_\_\_  
\_\_\_\_\_

14. Brad grew  $4\frac{1}{4}$  inches this year and is now  $56\frac{7}{8}$  inches tall. Write and solve an equation to find Brad's height at the start of the year. Show that your answer is reasonable.

\_\_\_\_\_  
\_\_\_\_\_

15. Heather finished a race in 58.4 seconds, which was 2.6 seconds less than her practice time. Write and solve an equation to find Heather's practice time. Show that your answer is reasonable.

\_\_\_\_\_  
\_\_\_\_\_

16. The radius of Earth is 6378.1 km, which is 2981.1 km longer than the radius of Mars. Write and solve an equation to determine the radius of Mars. Show that your answer is reasonable.

\_\_\_\_\_  
\_\_\_\_\_

**LESSON**  
**2-2**

**Practice B**  
**Solving Equations by Multiplying or Dividing**

Solve each equation. Check your answers.

- |                                  |                                   |   |
|----------------------------------|-----------------------------------|---|
| 1. $\frac{d}{8} = 6$<br>_____    | 2. $-5 = \frac{n}{2}$<br>_____    | 3. $2p = 54$<br>_____                     |
| 4. $\frac{-t}{2} = 12$<br>_____  | 5. $-40 = -4x$<br>_____           | 6. $\frac{2r}{3} = 16$<br>_____           |
| 7. $-49 = 7y$<br>_____           | 8. $-15 = -\frac{3n}{5}$<br>_____ | 9. $9m = 6$<br>_____                      |
| 10. $\frac{v}{-3} = -6$<br>_____ | 11. $2.8 = \frac{b}{4}$<br>_____  | 12. $\frac{3r}{4} = \frac{1}{8}$<br>_____ |

Answer each of the following.

13. The perimeter of a regular pentagon is 41.5 cm. Write and solve an equation to determine the length of each side of the pentagon.  
\_\_\_\_\_
14. In June 2005, Peter mailed a package from his local post office in Fayetteville, North Carolina to a friend in Radford, Virginia for \$2.07. The first-class rate at the time was \$0.23 per ounce. Write and solve an equation to determine the weight of the package.  
\_\_\_\_\_
15. Lola spends one-third of her allowance on movies. She spends \$8 per week at the movies. Write and solve an equation to determine Lola's weekly allowance.  
\_\_\_\_\_

## LESSON

**Practice B****2-3****Solving Two-Step and Multi-Step Equations**

Solve each equation. Check your answers.

1.  $-4x + 7 = 11$

\_\_\_\_\_

2.  $17 = 5y - 3$

\_\_\_\_\_

3.  $-4 = 2p + 10$

\_\_\_\_\_

4.  $3m + 4 = 1$

\_\_\_\_\_

5.  $12.5 = 2g - 3.5$

\_\_\_\_\_

6.  $-13 = -h - 7$

\_\_\_\_\_

7.  $-6 = \frac{y}{5} + 4$

\_\_\_\_\_

8.  $\frac{7}{9} = 2n + \frac{1}{9}$

\_\_\_\_\_

9.  $-\frac{4}{5}t + \frac{2}{5} = \frac{2}{3}$

\_\_\_\_\_

10.  $-(x - 10) = 7$

\_\_\_\_\_

11.  $-2(b + 5) = -6$

\_\_\_\_\_

12.  $8 = 4(q - 2) + 4$

\_\_\_\_\_

13. If  $3x - 8 = -2$ , find the value of  $x - 6$ .

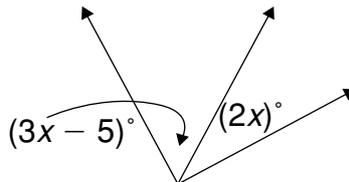
\_\_\_\_\_

14. If  $-2(3y + 5) = -4$ , find the value of  $5y$ .

\_\_\_\_\_

Answer each of the following.

15. The two angles shown form a right angle. Write and solve an equation to find the value of  $x$ .



\_\_\_\_\_

16. For her cellular phone service, Vera pays \$32 a month, plus \$0.75 for each minute over the allowed minutes in her plan. Vera received a bill for \$47 last month. For how many minutes did she use her phone beyond the allowed minutes?

\_\_\_\_\_

## LESSON

**Practice B****2-4 Solving Equations with Variables on Both Sides**

Solve each equation. Check your answers.

1.  $3d + 8 = 2d - 17$

\_\_\_\_\_

2.  $2n - 7 = 5n - 10$

\_\_\_\_\_

3.  $p - 15 = 13 - 6p$

\_\_\_\_\_

4.  $-t + 5 = t - 19$

\_\_\_\_\_

5.  $15x - 10 = -9x + 2$

\_\_\_\_\_

6.  $1.8r + 9 = -5.7r - 6$

\_\_\_\_\_

7.  $2y + 3 = 3(y + 7)$

\_\_\_\_\_

8.  $4n + 6 - 2n = 2(n + 3)$

\_\_\_\_\_

9.  $6m - 8 = 2 + 9m - 1$

\_\_\_\_\_

10.  $-v + 5 + 6v = 1 + 5v + 3$

\_\_\_\_\_

11.  $2(3b - 4) = 8b - 11$

\_\_\_\_\_

12.  $5(r - 1) = 2(r - 4) - 6$

\_\_\_\_\_

Answer each of the following.

13. Janine has job offers at two companies. One company offers a starting salary of \$28,000 with a raise of \$3000 each year. The other company offers a starting salary of \$36,000 with a raise of \$2000 each year.

a. After how many years would Janine's salary be the same with both companies?

\_\_\_\_\_

b. What would that salary be?

\_\_\_\_\_

14. Xian and his cousin both collect stamps. Xian has 56 stamps, and his cousin has 80 stamps. Both have recently joined different stamp-collecting clubs. Xian's club will send him 12 new stamps per month, and his cousin's club will send him 8 new stamps per month.

a. After how many months will Xian and his cousin have the same number of stamps?

\_\_\_\_\_

b. How many stamps will that be?

\_\_\_\_\_

## LESSON

**Practice B****2-5 Solving for a Variable**

Answer each of the following.

1. The formula  $C = 2\pi r$  relates the radius  $r$  of a circle to its circumference  $C$ . Solve the formula for  $r$ .
2. The formula  $y = mx + b$  is called the slope-intercept form of a line. Solve this formula for  $m$ .

\_\_\_\_\_

\_\_\_\_\_

Solve each equation for the variable indicated.

3.  $4c = d$  for  $c$

4.  $n - 6m = 8$  for  $n$

5.  $2p + 5r = q$  for  $p$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

6.  $-10 = xy + z$  for  $x$

7.  $\frac{a}{b} = c$  for  $b$

8.  $\frac{h-4}{j} = k$  for  $j$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Answer each of the following.

9. The formula  $c = 5p + 215$  relates  $c$ , the total cost in dollars of hosting a birthday party at a skating rink, to  $p$ , the number of people attending.

a. Solve the formula  $c = 5p + 215$  for  $p$ .

\_\_\_\_\_

- b. If Allie's parents are willing to spend \$300 for a party, how many people can attend?

\_\_\_\_\_

10. The formula for the area of a triangle is  $A = \frac{1}{2}bh$ , where  $b$  represents the length of the base and  $h$  represents the height.

a. Solve the formula  $A = \frac{1}{2}bh$  for  $b$ .

\_\_\_\_\_

- b. If a triangle has an area of  $192 \text{ mm}^2$ , and the height measures 12 mm, what is the measure of the base?

\_\_\_\_\_

## LESSON

**Practice B****2-6 Rates, Ratios, and Proportions**

1. The ratio of freshman to sophomores in a drama club is 5:6. There are 18 sophomores in the drama club. How many freshmen are there? \_\_\_\_\_

Find each unit rate.

2. Four pounds of apples cost \$1.96. \_\_\_\_\_
3. Sal washed 5 cars in 50 minutes. \_\_\_\_\_

4. A giraffe can run 32 miles per hour. What is this speed in feet per second? Round your answer to the nearest tenth. \_\_\_\_\_

Solve each proportion.

5.  $\frac{y}{4} = \frac{10}{8}$

\_\_\_\_\_

6.  $\frac{2}{x} = \frac{30}{-6}$

\_\_\_\_\_

7.  $\frac{3}{12} = \frac{-24}{m}$

\_\_\_\_\_

8.  $\frac{3t}{10} = \frac{1}{2}$

\_\_\_\_\_

9.  $\frac{32}{4} = \frac{b+4}{3}$

\_\_\_\_\_

10.  $\frac{7}{x} = \frac{1}{0.5}$

\_\_\_\_\_

11. Sam is building a model of an antique car. The scale of his model to the actual car is 1:10. His model is  $18\frac{1}{2}$  inches long. How long is the actual car? \_\_\_\_\_

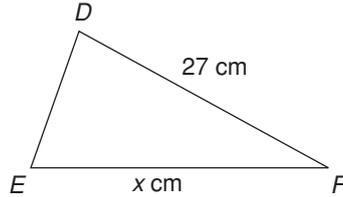
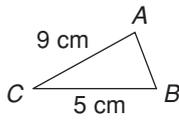
12. The scale on a map of Virginia shows that 1 centimeter represents 30 miles. The actual distance from Richmond, VA to Washington, DC is 110 miles. On the map, how many centimeters are between the two cities? Round your answer to the nearest tenth. \_\_\_\_\_

**LESSON**  
**2-7**

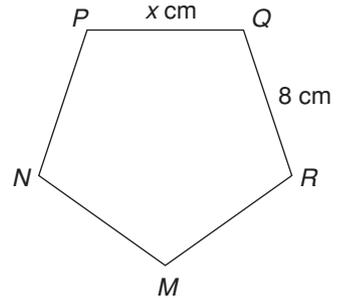
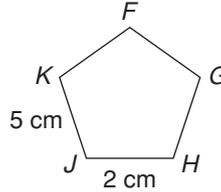
**Practice B**  
**Applications of Proportions**

Find the value of  $x$  in each diagram.

1.  $\triangle ABC \sim \triangle DEF$



2.  $FGHJK \sim MNPQR$



\_\_\_\_\_

\_\_\_\_\_

3. A utility worker is 5.5 feet tall and is casting a shadow 4 feet long. At the same time, a nearby utility pole casts a shadow 20 feet long. Write and solve a proportion to find the height of the utility pole.

\_\_\_\_\_

4. A cylinder has a radius of 3 cm and a length of 10 cm. Every dimension of the cylinder is multiplied by 3 to form a new cylinder. How is the ratio of the volumes related to the ratio of corresponding dimensions?

\_\_\_\_\_

5. A rectangle has an area of  $48 \text{ in}^2$ . Every dimension of the rectangle is multiplied by a scale factor, and the new rectangle has an area of  $12 \text{ in}^2$ . What was the scale factor?

\_\_\_\_\_

**LESSON** **Practice B**  
**2-8** *Percents*

Write each percent as a decimal and as a fraction.

1. 17%

\_\_\_\_\_

\_\_\_\_\_

2. 22%

\_\_\_\_\_

\_\_\_\_\_

3. 68%

\_\_\_\_\_

\_\_\_\_\_

4. 2.5%

\_\_\_\_\_

\_\_\_\_\_

5. 140%

\_\_\_\_\_

\_\_\_\_\_

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

\_\_\_\_\_

\_\_\_\_\_

Write each decimal or fraction as a percent.

7. 0.28 \_\_\_\_\_

8.  $\frac{13}{50}$  \_\_\_\_\_

9.  $\frac{19}{10}$  \_\_\_\_\_

Find each value. Round to the nearest tenth if necessary.

10. 3% of 100

\_\_\_\_\_

11. 100% of 3

\_\_\_\_\_

12. 80% of 120

\_\_\_\_\_

13. 115% of 6

\_\_\_\_\_

14. What percent of 128 is 32?

\_\_\_\_\_

15. 3 is what percent of 36?

\_\_\_\_\_

16. 23.7 is 30% of what number?

\_\_\_\_\_

17.  $7\frac{1}{2}\%$  of what number is 12?

\_\_\_\_\_

18. According to the US Census, Virginia had about 7.1 million residents in 2000. Of those, 24.6% were under age 18. To the nearest tenth of a million, how many Virginia residents were under age 18 in 2000?

\_\_\_\_\_

19. A CD-ROM has 700 megabytes of storage space. What percent of the space is used by a file that takes up 154 megabytes?

\_\_\_\_\_

## LESSON

**2-9****Practice B*****Applications of Percents***

Solve each problem.

1. Mr. Holtzclaw sells his home for \$240,000. He must pay the real estate agents a 5% commission. How much is the commission? \_\_\_\_\_
2. A textbook salesperson is paid a base salary of \$35,000 plus a 3% commission on sales. Her total sales last year were \$620,000. Find her total pay last year. \_\_\_\_\_
3. A music publisher earns a 6.75% commission on the money made from the use of a song on a CD. If the music publisher earns \$84,375, how much money was made from the use of the song? \_\_\_\_\_
4. Find the simple interest earned after 5 years on \$1200 invested at 2% annual interest rate. \_\_\_\_\_
5. After 6 months, \$1.78 simple interest was earned on an investment of \$890. Find the annual interest rate. \_\_\_\_\_
6. Ms. Pecho currently owes \$637.50 simple interest on a loan of \$2500 at an annual interest rate of 17%. How long has she had the loan? \_\_\_\_\_
7. The lunch check for Tawfiq and Helen is \$16.98. Estimate the tip using a rate of 15%. \_\_\_\_\_
8. The state sales tax rate in North Carolina is 4.5%. Estimate the state sales tax on a model of the Wright Brothers' airplane that costs \$139.99. \_\_\_\_\_
9. A wedding reception is held at a restaurant in Mississippi. The food and drinks cost \$1492.50. The state sales tax rate is 7%, and the restaurant automatically adds a 20% tip for large parties.
  - a. Estimate the state sales tax. \_\_\_\_\_
  - b. Estimate the tip. \_\_\_\_\_
  - c. Estimate the total bill for food, drinks, tax, and tip. \_\_\_\_\_

**LESSON**  
**2-10** **Practice B**  
**Percent Increase and Decrease**

Find each percent change. Tell whether it is a percent increase or decrease.

- |                      |                       |                       |
|----------------------|-----------------------|-----------------------|
| 1. 8 to 10<br>_____  | 2. 50 to 20<br>_____  | 3. 120 to 54<br>_____ |
| 4. 12 to 96<br>_____ | 5. 72 to 108<br>_____ | 6. 2 to 1.3<br>_____  |

Solve each problem.

- |  |  |
|--|--|
| 7. Find the result when 20 is increased by 35%.<br>_____   | 8. Find the result when 40 is increased by 64%.<br>_____   |
| 9. Find the result when 68 is decreased by 25%.<br>_____   | 10. Find the result when 120 is decreased by 15%.<br>_____ |
| 11. A pharmacy discount card gives the user 40% off prescriptions. Mr. Allen's cholesterol medication normally costs \$96.50. What is the final price with the discount card?<br>_____ |  |
| 12. A gas station purchases fuel at a wholesale price of \$1.75 per gallon. The price is marked up 8%. What is the selling price per gallon?<br>_____                                  |  |
| 13. San Francisco's Bay Area Rapid Transit (BART) sells \$48 tickets at a discount price of \$45. What is the percent discount?<br>_____   |  |
| 14. A recording company sells a music CD for the wholesale price of \$12.75. A record store marks up the price to \$19.89. What is the markup as a percent?<br>_____                   |  |

Find each missing number.

15. 50 increased by 20% is \_\_\_\_\_.
16. 10 increased by \_\_\_\_\_% is 30.
17. 200 decreased by 55% is \_\_\_\_\_.
18. 60 decreased by \_\_\_\_\_% is 45.

**LESSON** **Practice B**  
**3-1** *Graphing and Writing Inequalities*

Describe the solutions of each inequality in words.

1.  $2m \geq 6$  \_\_\_\_\_

2.  $t + 3 < 8$  \_\_\_\_\_

3.  $1 < x - 5$  \_\_\_\_\_

4.  $-10 \geq \frac{1}{2}c$  \_\_\_\_\_

Graph each inequality.

5.  $x > -7$   

 A horizontal number line with arrows at both ends. There are 14 tick marks. The 7th tick mark from the left is the starting point for an open circle. A thick line is drawn to the right of this circle.

6.  $p \geq 2^3$   

 A horizontal number line with arrows at both ends. There are 14 tick marks. The 7th tick mark from the left is the starting point for a closed circle. A thick line is drawn to the right of this circle.

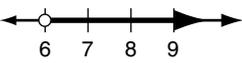
7.  $4.5 \geq r$   

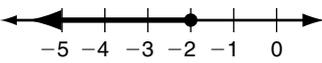
 A horizontal number line with arrows at both ends. There are 14 tick marks. The 7th tick mark from the left is the starting point for a closed circle. A thick line is drawn to the right of this circle.

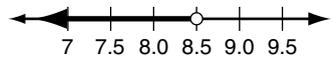
8.  $y < -\sqrt{14 - 5}$   

 A horizontal number line with arrows at both ends. There are 14 tick marks. The 7th tick mark from the left is the starting point for an open circle. A thick line is drawn to the right of this circle.

Write the inequality shown by each graph.

9. 
 \_\_\_\_\_  
 A horizontal number line with arrows at both ends. There are 14 tick marks. The 6th tick mark from the left is the starting point for an open circle. A thick line is drawn to the right of this circle.

10. 
 \_\_\_\_\_  
 A horizontal number line with arrows at both ends. There are 14 tick marks. The 7th tick mark from the left is the starting point for a closed circle. A thick line is drawn to the left of this circle.

11. 
 \_\_\_\_\_  
 A horizontal number line with arrows at both ends. There are 14 tick marks. The 8th tick mark from the left is the starting point for an open circle. A thick line is drawn to the right of this circle.

12. 
 \_\_\_\_\_  
 A horizontal number line with arrows at both ends. There are 14 tick marks. The 9th tick mark from the left is the starting point for a closed circle. A thick line is drawn to the right of this circle.

Define a variable and write an inequality for each situation. Graph the solutions.

13. Josephine sleeps more than 7 hours each night.



14. In 1955, the minimum wage in the U.S. was \$0.75 per hour.



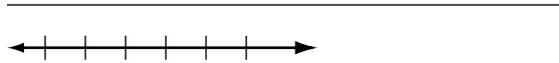
**LESSON** **Practice B**  
**3-2 Solving Inequalities by Adding or Subtracting**

Solve each inequality and graph the solutions.

1.  $b + 8 > 15$



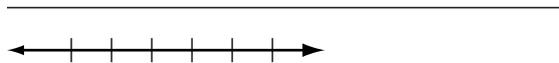
2.  $t - 5 \geq -2$



3.  $-4 + x \geq 1$



4.  $g + 8 < 2$



5.  $-9 \geq m - 9$

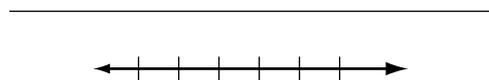


6.  $15 > d + 19$



Answer each question.

7. Jessica makes overtime pay when she works more than 40 hours in a week. So far this week she has worked 29 hours. She will continue to work  $h$  hours this week. Write, solve, and graph an inequality to show the values of  $h$  that will allow Jessica to earn overtime pay.



8. Henry's MP3 player has 512MB of memory. He has already downloaded 287MB and will continue to download  $m$  more megabytes. Write and solve an inequality that shows how many more megabytes he can download.



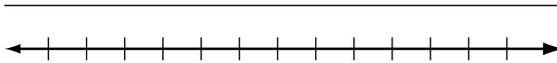
9. Eleanor needs to read at least 97 pages of a book for homework. She has read 34 pages already. Write and solve an inequality that shows how many more pages  $p$  she must read.



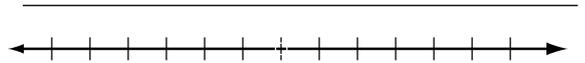
**LESSON** **3-3** **Practice B**  
**Solving Inequalities by Multiplying or Dividing**

Solve each inequality and graph the solutions.

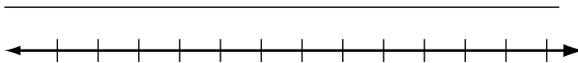
1.  $4a > 32$



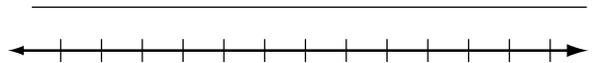
2.  $-7y < 21$



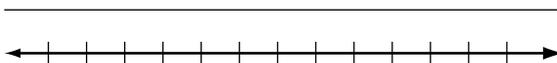
3.  $1.5n \leq -18$



4.  $-\frac{3}{8}c \geq 9$



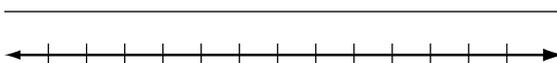
5.  $\frac{y}{5} > 4$



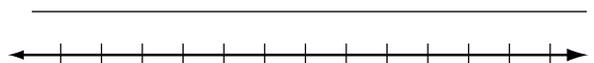
6.  $2s \leq -3$



7.  $-\frac{1}{3}b < -6$



8.  $\frac{z}{-8} \geq -0.25$



**Write and solve an inequality for each problem.**

9. Phil has a strip of wood trim that is 16 feet long. He needs 5-foot pieces to trim some windows. What are the possible numbers of pieces he can cut?

\_\_\_\_\_

10. A teacher buys a 128-ounce bottle of juice and serves it in 5-ounce cups. What are the possible numbers of cups she can fill?

\_\_\_\_\_

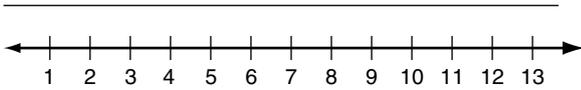
11. At an online bookstore, Kendra bought 4 copies of the same book for the members of her book club. She got free shipping because her total was at least \$50. What was the minimum price of each book?

\_\_\_\_\_

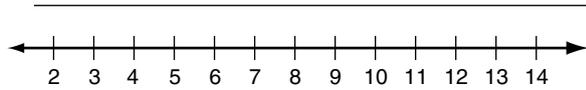
**LESSON** **Practice B**  
**3-4 Solving Two-Step and Multi-Step Inequalities**

Solve each inequality and graph the solutions.

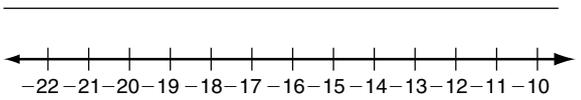
1.  $-3a + 10 < -11$



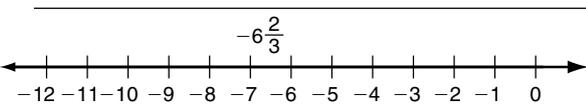
2.  $4x - 12 \geq 20$



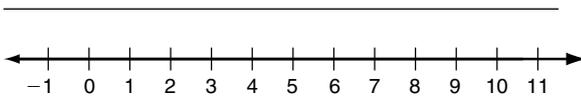
3.  $\frac{2k - 3}{-5} > 7$



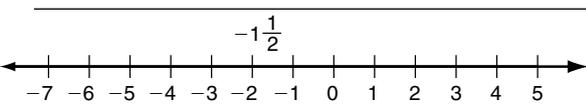
4.  $-\frac{1}{5}z + \frac{2}{3} \leq 2$



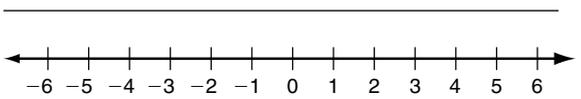
5.  $6(n - 8) \geq -18$



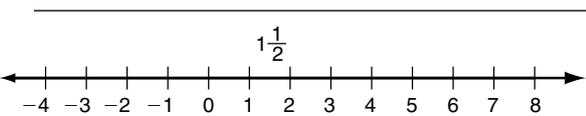
6.  $10 - 2(3x + 4) < 11$



7.  $7 + 2c - 4^2 \leq -9$



8.  $15p + 3(p - 1) > 3(2^3)$

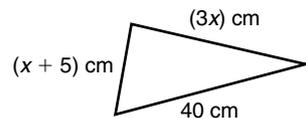


Write and solve an inequality for each problem.

9. A full-year membership to a gym costs \$325 upfront with no monthly charge. A monthly membership costs \$100 upfront and \$30 per month. For what numbers of months is it less expensive to have a monthly membership?

\_\_\_\_\_

10. The sum of the lengths of any two sides of a triangle must be greater than the length of the third side. What are the possible values of  $x$  for this triangle?

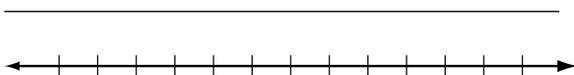


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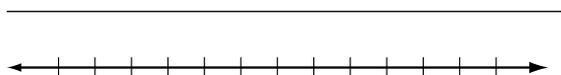
**LESSON** **Practice B**  
**3-5 Solving Inequalities with Variables on Both Sides**

Solve each inequality and graph the solutions.

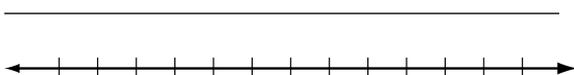
1.  $2x + 30 \geq 7x$



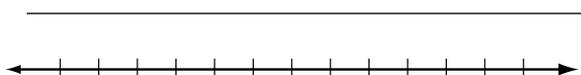
2.  $2k + 6 < 5k - 3$



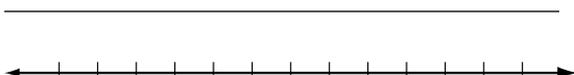
3.  $3b - 2 \leq 2b + 1$



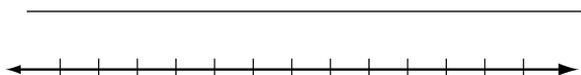
4.  $2(3n + 7) > 5n$



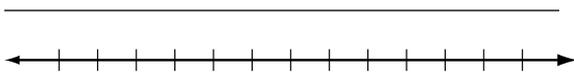
5.  $5s - 9 < 2(s - 6)$



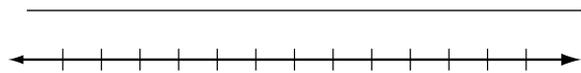
6.  $-3(3x + 5) \geq -5(2x - 2)$



7.  $1.4z + 2.2 > 2.6z - 0.2$



8.  $\frac{7}{8}p - \frac{1}{4} \leq \frac{1}{2}p$



Solve each inequality.

9.  $v + 1 > v - 6$



10.  $3(x + 4) \leq 3x$

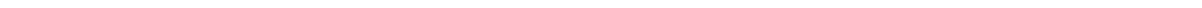


11.  $-2(8 - 3x) \geq 6x + 2$

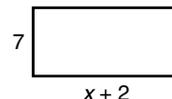


Write and solve an inequality for each problem.

12. Ian wants to promote his band on the Internet. Site A offers website hosting for \$4.95 per month with a \$49.95 startup fee. Site B offers website hosting for \$9.95 per month with no startup fee. For how many months would Ian need to keep the website for Site B to be less expensive than Site A?

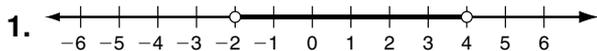


13. For what values of  $x$  is the area of the rectangle greater than the perimeter?

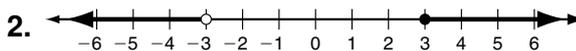


**LESSON** **Practice B**  
**3-6 Solving Compound Inequalities**

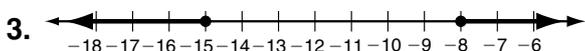
Write the compound inequality shown by each graph.



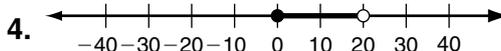
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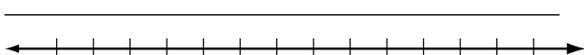
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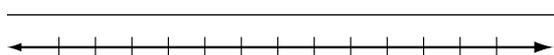
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Solve each compound inequality and graph the solutions.

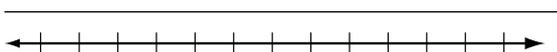
5.  $-15 < x - 8 < -4$



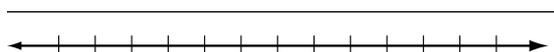
6.  $12 \leq 4n < 28$



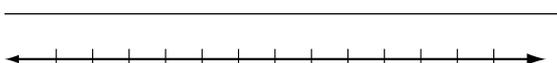
7.  $-2 \leq 3b + 7 \leq 13$



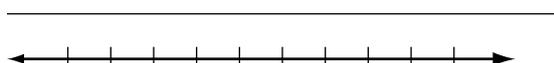
8.  $x - 3 < -3$  OR  $x - 3 \geq 3$



9.  $5k \leq -20$  OR  $2k \geq 8$

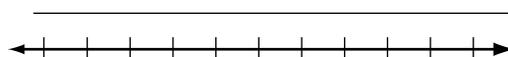


10.  $2s + 3 \leq 7$  OR  $3s + 5 > 26$

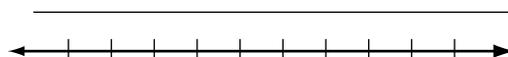


Write a compound inequality for each problem. Graph the solutions.

11. The human ear can distinguish sounds between 20 Hz and 20,000 Hz, inclusive.



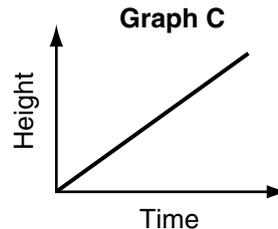
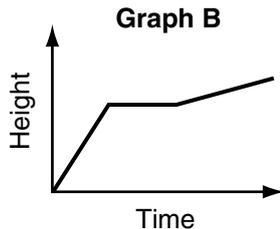
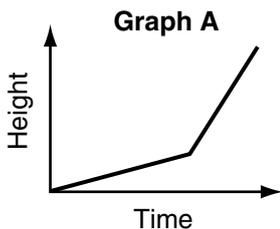
12. For a man to box as a welterweight, he must weigh more than 140 lbs, but at most 147 lbs.



**LESSON**  
**4-1**

**Practice B**  
**Graphing Relationships**

Choose the graph that best represents each situation.

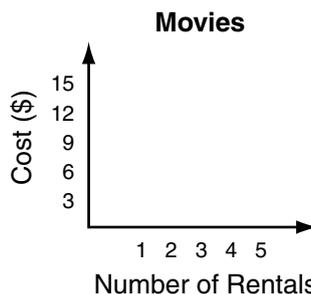


1. A tomato plant grows taller at a steady pace.
2. A tomato plant grows quickly at first, remains a constant height during a dry spell, then grows at a steady pace.
3. A tomato plant grows at a slow pace, then grows rapidly with more sun and water.
4. Lora has \$15 to spend on movie rentals for the week. Each rental costs \$3. Sketch a graph to show how much money she might spend on movies in a week. Tell whether the graph is continuous or discrete.

\_\_\_\_\_

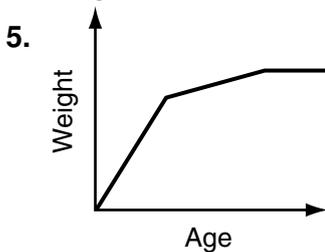
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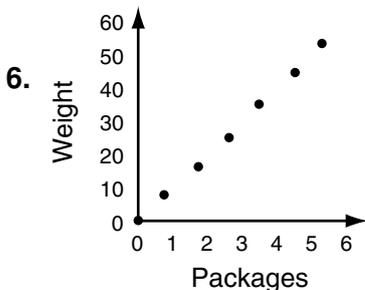


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Write a possible situation for each graph.



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\_\_\_\_\_



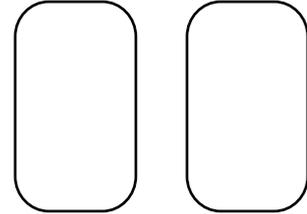
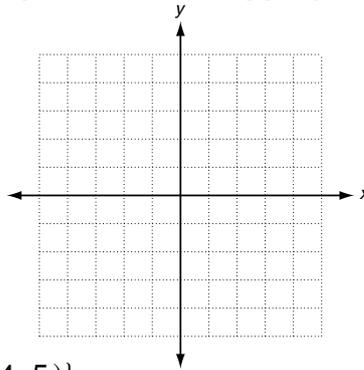
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**LESSON** **Practice B**  
**4-2** **Relations and Functions**

Express each relation as a table, as a graph, and as a mapping diagram.

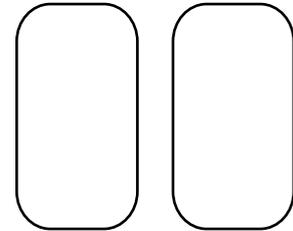
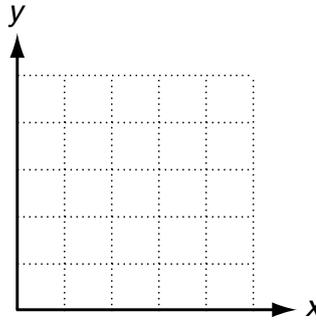
1.  $\{(-5, 3), (-2, 1), (1, -1), (4, -3)\}$

x	y

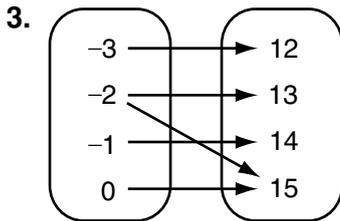


2.  $\{(4, 0), (4, 1), (4, 2), (4, 3), (4, 4), (4, 5)\}$

x	y



Give the domain and range of each relation. Tell whether the relation is a function. Explain.



D: \_\_\_\_\_

R: \_\_\_\_\_

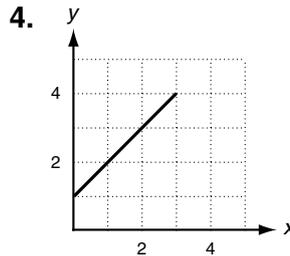
Function? \_\_\_\_\_

Explain: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



D: \_\_\_\_\_

R: \_\_\_\_\_

Function? \_\_\_\_\_

Explain: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

5. 

x	y
8	8
6	6
4	4
2	6
0	8

D: \_\_\_\_\_

R: \_\_\_\_\_

Function? \_\_\_\_\_

Explain: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**LESSON**

**Practice B**

**4-3 Writing Functions**

Determine a relationship between the  $x$ - and  $y$ -values. Write an equation.

1. 

$x$	-4	-3	-2	-1
$y$	-1	0	1	2

2.  $\{(2, 3), (3, 5), (4, 7), (5, 9)\}$

\_\_\_\_\_

Identify the independent and dependent variables in each situation.

3. Ice cream sales increase when the temperature rises.

4. Food for the catered party costs \$12.75 per person.

I: \_\_\_\_\_

I: \_\_\_\_\_

D: \_\_\_\_\_

D: \_\_\_\_\_

Identify the independent and dependent variables. Write a rule in function notation for each situation.

5. Carson charges \$7 per hour for yard work.

6. Kay donates twice what Ed donates.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Evaluate each function for the given input values.

7. For  $f(x) = 5x + 1$ , find  $f(x)$  when  $x = 2$  and when  $x = 3$ . \_\_\_\_\_

8. For  $g(x) = -4x$ , find  $g(x)$  when  $x = -6$  and when  $x = 2$ . \_\_\_\_\_

9. For  $h(x) = x - 3$ , find  $h(x)$  when  $x = 3$  and when  $x = 1$ . \_\_\_\_\_

Complete the following.

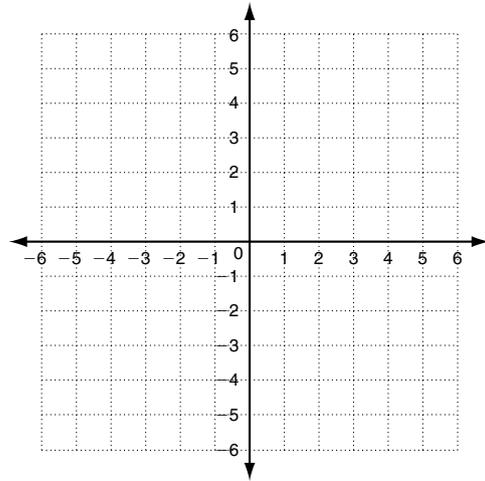
10. An aerobics class is being offered once a week for 6 weeks. The registration fee is \$15 and the cost for each class attended is \$10. Write a function rule to describe the total cost of the class. Find a reasonable domain and range for the function.

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**LESSON**  
**4-4** **Practice B**  
**Graphing Functions**

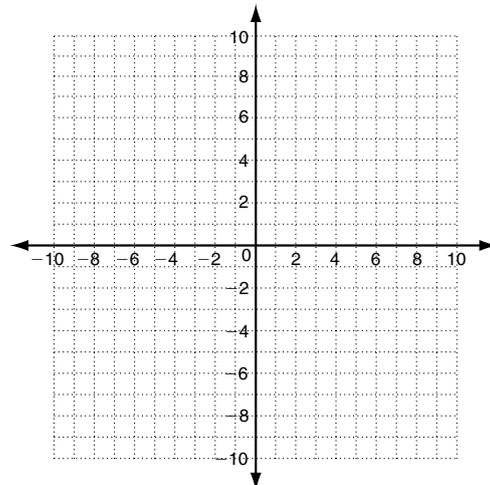
Graph the function for the given domain.

1.  $y = |x| - 1$ ; D:  $\{-1, 0, 1, 2, 3\}$



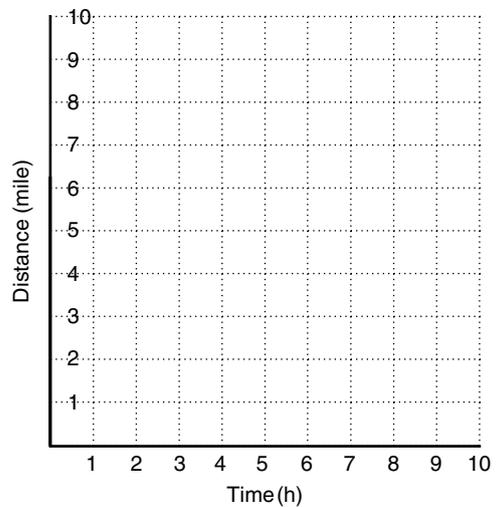
Graph the function.

2.  $f(x) = x^2 - 3$



3. One of the slowest fish is the blenny fish. The function  $y = 0.5x$  describes how many miles  $y$  the fish swims in  $x$  hours. Graph the function. Use the graph to estimate the number of miles the fish swims in 3.5 hours.

\_\_\_\_\_

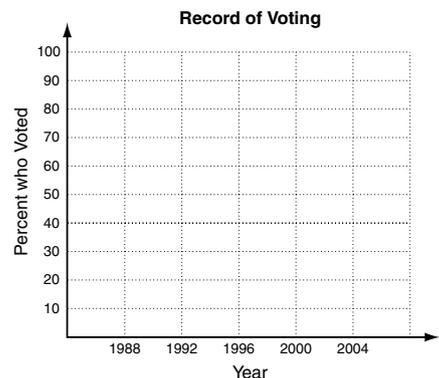


**LESSON**  
**4-5** **Practice B**  
**Scatter Plots and Trend Lines**

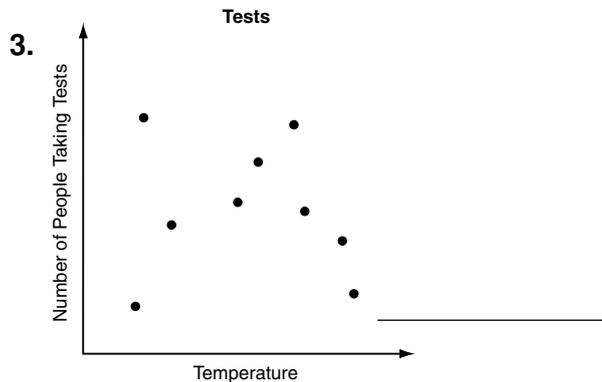
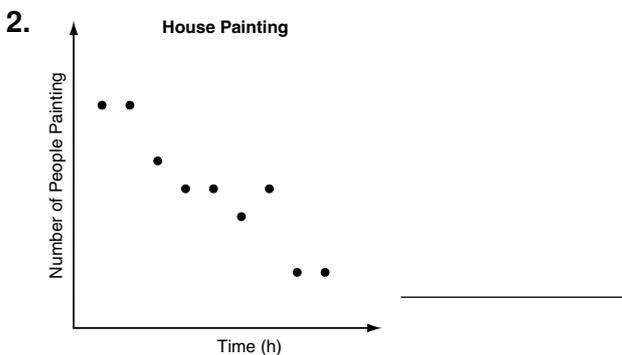
Graph a scatter plot using the given data.

- The table shows the percent of people ages 18–24 who reported they voted in the presidential elections. Graph a scatter plot using the given data.

Year	1988	1992	1996	2000	2004
% of 18-24 year olds	36	43	32	32	42



Write *positive*, *negative*, or *none* to describe the correlation illustrated by each scatter plot.



- Identify the correlation you would expect to see between the number of pets a person has and the number of times they go to a pet store. Explain.

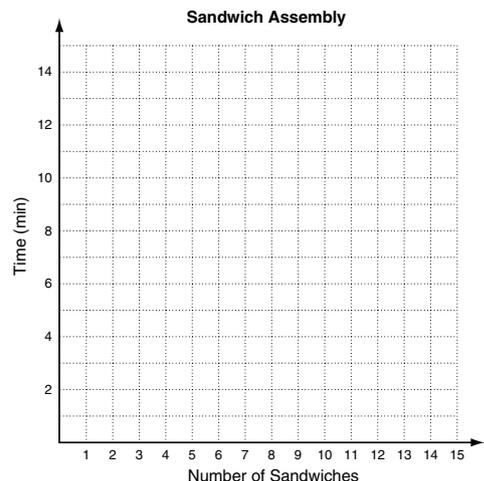
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Neal kept track of the number of minutes it took him to assemble sandwiches at his restaurant. The information is in the table below.

<b>Number of sandwiches</b>	1	2	4	6	7
<b>Minutes</b>	3	4	5	6	7

- Graph a scatter plot of the data.
- Draw a trend line.
- Describe the correlation.  
\_\_\_\_\_
- Based on the trend line you drew, predict the amount of time it will take Neal to assemble 12 sandwiches.  
\_\_\_\_\_



## LESSON

**Practice B****4-6****Arithmetic Sequences**

Determine whether each sequence is an arithmetic sequence.  
If so, find the common difference and the next three terms.

1.  $-10, -7, -4, -1, \dots$

2.  $0, 1.5, 3, 4.5, \dots$

\_\_\_\_\_

\_\_\_\_\_

3.  $5, 8, 12, 17, \dots$

4.  $-20, -20.5, -21, -21.5, \dots$

\_\_\_\_\_

\_\_\_\_\_

Find the indicated term of each arithmetic sequence.

5. 28th term:  $0, -4, -8, -12, \dots$

6. 15th term:  $2, 3.5, 5, 6.5, \dots$

\_\_\_\_\_

\_\_\_\_\_

7. 37th term:  $a_1 = -3; d = 2.8$

8. 14th term:  $a_1 = 4.2; d = -5$

\_\_\_\_\_

\_\_\_\_\_

9. 17th term;  $a_1 = 2.3; d = -2.3$

10. 92nd term;  $a_1 = 1; d = 0.8$

\_\_\_\_\_

\_\_\_\_\_

11. A movie rental club charges \$4.95 for the first month's rentals. The club charges \$18.95 for each additional month. How much is the total cost for one year?

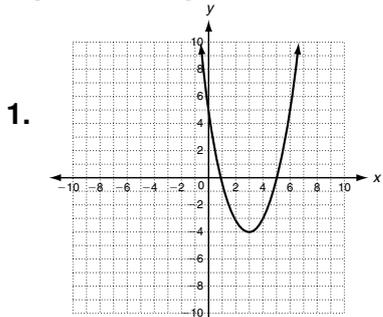
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12. A carnival game awards a prize if Kasey can shoot a basket. The charge is \$5.00 for the first shot, then \$2.00 for each additional shot. Kasey needed 11 shots to win a prize. What is the total amount Kasey spent to win a prize?

\_\_\_\_\_

**LESSON**  
**5-1** **Practice B**  
**Identifying Linear Functions**

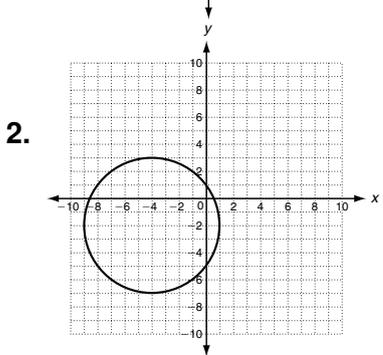
Identify whether each graph represents a function. Explain. If the graph does represent a function, is the function linear?



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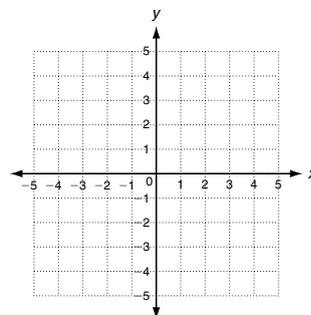
3. Which set of ordered pairs satisfies a linear function? Explain.

**Set A:**  $\{(5, 1), (4, 4), (3, 9), (2, 16), (1, 25)\}$  \_\_\_\_\_

**Set B:**  $\{(1, -5), (2, -3), (3, -1), (4, 1), (5, 3)\}$  \_\_\_\_\_

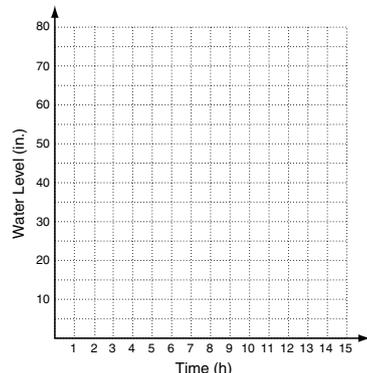
4. Write  $y = -2x$  in standard form. Then graph the function.

\_\_\_\_\_



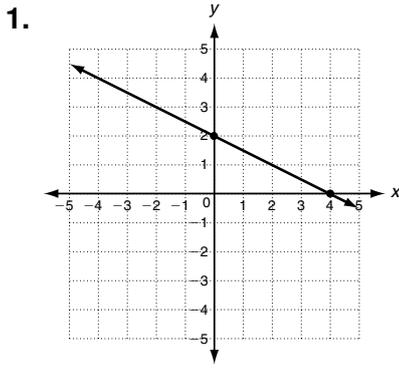
5. In 2005, the Shabelle River in Somalia rose an estimated 5.25 inches every hour for 15 hours. The increase in water level is represented by the function  $f(x) = 5.25x$ , where  $x$  is the number of hours. Graph this function and give its domain and range.

\_\_\_\_\_



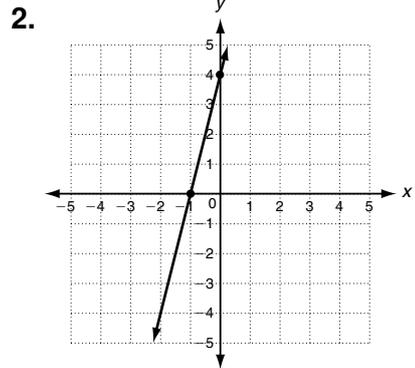
**LESSON**  
**5-2** **Practice B**  
**Using Intercepts**

Find the x- and y-intercepts.



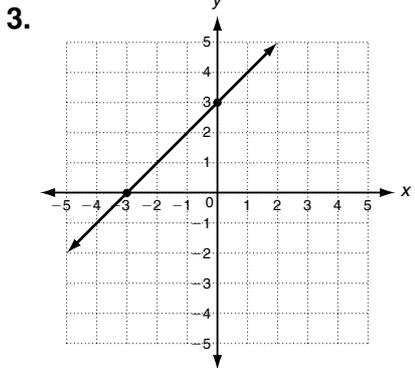
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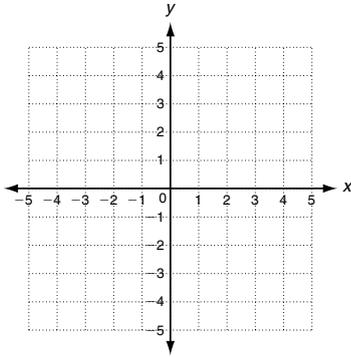


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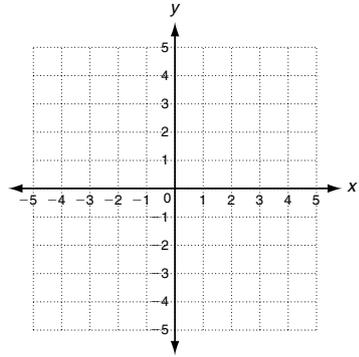
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Use intercepts to graph the line described by each equation.

4.  $3x + 2y = -6$



5.  $x - 4y = 4$



6. At a fair, hamburgers sell for \$3.00 each and hot dogs sell for \$1.50 each. The equation  $3x + 1.5y = 30$  describes the number of hamburgers and hot dogs a family can buy with \$30.

a. Find the intercepts and graph the function.

\_\_\_\_\_

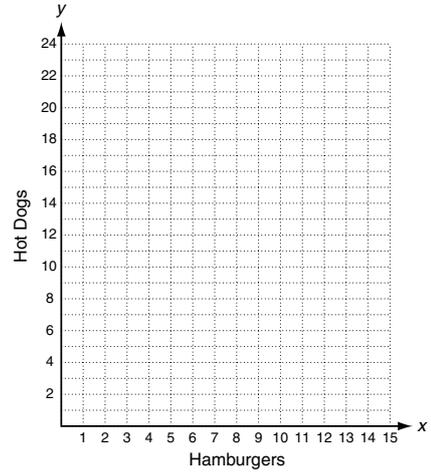
b. What does each intercept represent?

\_\_\_\_\_

\_\_\_\_\_

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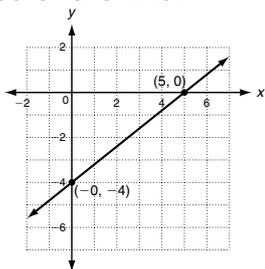
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**LESSON**  
**5-3** **Practice B**  
**Rate of Change and Slope**

Find the rise and run between each set of points. Then, write the slope of the line.

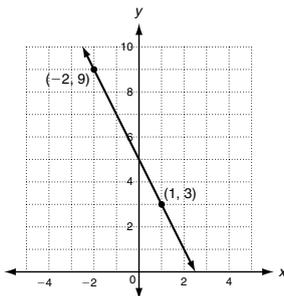
1.



rise = \_\_\_\_\_ run = \_\_\_\_\_

slope = \_\_\_\_\_

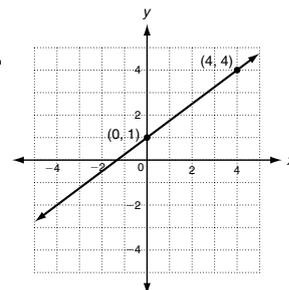
2.



rise = \_\_\_\_\_ run = \_\_\_\_\_

slope = \_\_\_\_\_

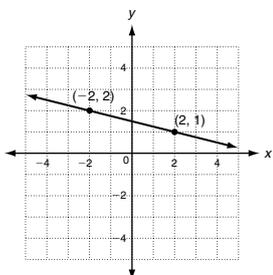
3.



rise = \_\_\_\_\_ run = \_\_\_\_\_

slope = \_\_\_\_\_

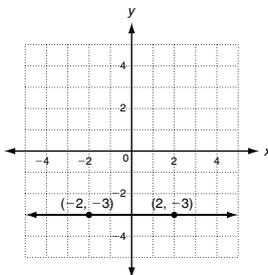
4.



rise = \_\_\_\_\_ run = \_\_\_\_\_

slope = \_\_\_\_\_

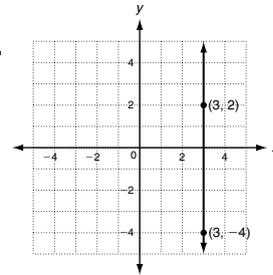
5.



rise = \_\_\_\_\_ run = \_\_\_\_\_

slope = \_\_\_\_\_

6.

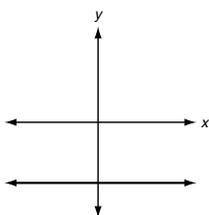


rise = \_\_\_\_\_ run = \_\_\_\_\_

slope = \_\_\_\_\_

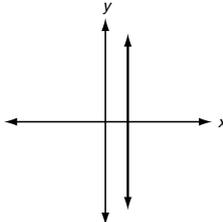
Tell whether the slope of each line is positive, negative, zero, or undefined.

7.



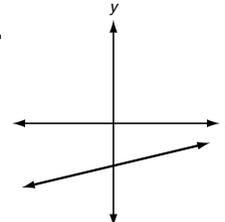
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8.



\_\_\_\_\_

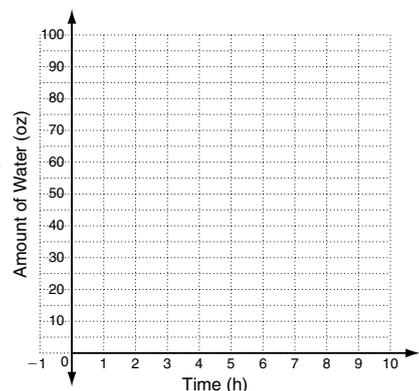
9.



\_\_\_\_\_

10. The table shows the amount of water in a pitcher at different times. Graph the data and show the rates of change. Between which two hours is the rate of change the greatest? \_\_\_\_\_

Time (h)	0	1	2	3	4	5	6	7
Amount (oz)	60	50	25	80	65	65	65	50



**LESSON**  
**5-4** **Practice B**  
**The Slope Formula**

Find the slope of the line that contains each pair of points.

1. (2, 8) and (1, -3)

2. (-4, 0) and (-6, -2)

3. (0, -2) and (4, -7)

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{\boxed{\phantom{00}} - \boxed{\phantom{00}}}{\boxed{\phantom{00}} - \boxed{\phantom{00}}}$$

$$= \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} = \boxed{\phantom{00}}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{\boxed{\phantom{00}} - \boxed{\phantom{00}}}{\boxed{\phantom{00}} - \boxed{\phantom{00}}}$$

$$= \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} = \boxed{\phantom{00}}$$

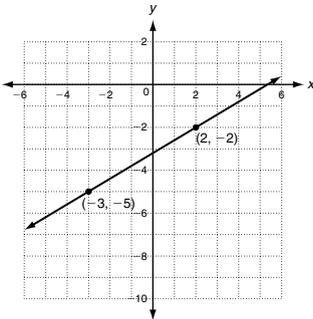
$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{\boxed{\phantom{00}} - \boxed{\phantom{00}}}{\boxed{\phantom{00}} - \boxed{\phantom{00}}}$$

$$= \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$$

Each graph or table shows a linear relationship. Find the slope.

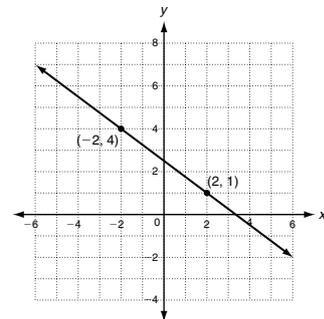
4.



5.

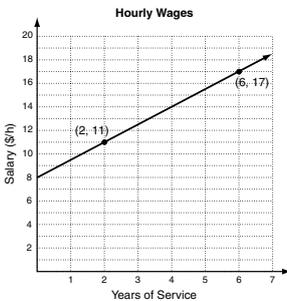
x	y
1	3.75
2	5
3	6.25
4	7.50
5	8.75

6.

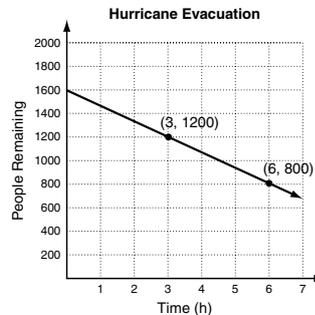


Find the slope of each line. Then tell what the slope represents.

7.



8.



Find the slope of the line described by each equation.

9.  $3x + 4y = 24$

10.  $8x = 48 + 3y$



**LESSON**  
**5-6**

**Practice B**  
**Slope-Intercept Form**

Write the equation that describes each line in slope-intercept form

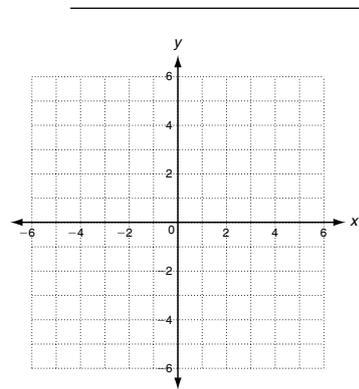
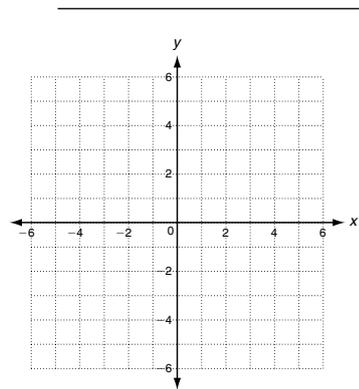
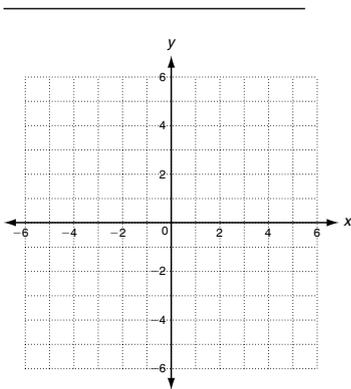
- 1. slope = 4; y-intercept = -3  
 $y =$  \_\_\_\_\_
- 2. slope = -2; y-intercept = 0  
 $y =$  \_\_\_\_\_
- 3. slope =  $-\frac{1}{3}$ ; y-intercept = 6  
 $y =$  \_\_\_\_\_

- 4. slope =  $\frac{2}{5}$ , (10, 3) is on the line.  
Find the y-intercept:  $y = mx + b$   
\_\_\_\_\_ = (\_\_\_\_) \_\_\_\_\_ +  $b$   
\_\_\_\_\_ = \_\_\_\_\_ +  $b$   
\_\_\_\_\_ =  $b$

Write the equation:  $y =$  \_\_\_\_\_

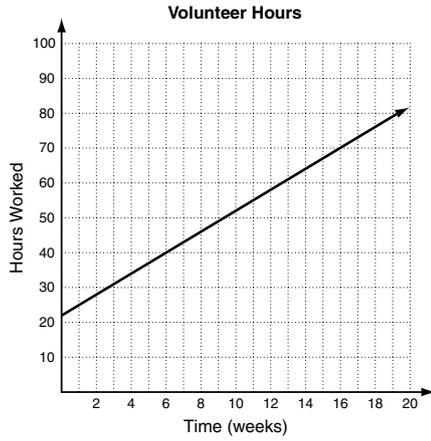
Write each equation in slope-intercept form. Then graph the line described by the equation.

- 5.  $y + x = 3$
- 6.  $y + 4 = \frac{4}{3}x$
- 7.  $5x - 2y = 10$



8. Daniel works as a volunteer in a homeless shelter. So far, he has worked 22 hours, and he plans to continue working 3 hours per week. His hours worked as a function of time is shown in the graph.

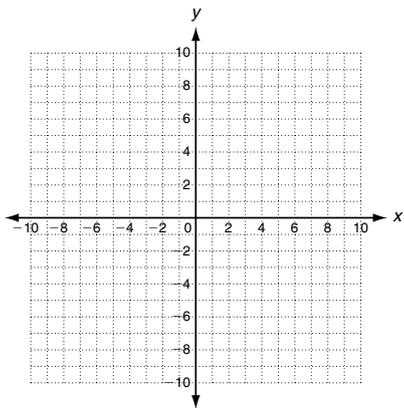
- a. Write an equation that represents the hours Daniel will work as a function of time. \_\_\_\_\_
- b. Identify the slope and y-intercept and describe their meanings. \_\_\_\_\_  
\_\_\_\_\_
- c. Find the number of hours worked after 16 weeks.  
\_\_\_\_\_



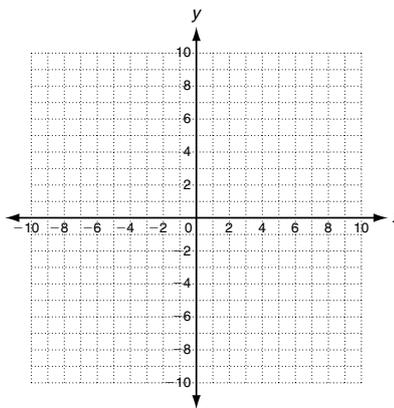
**LESSON**  
**5-7** **Practice B**  
**Point-Slope Form**

Graph the line with the given slope that contains the given point.

1. slope =  $\frac{2}{3}$ ;  $(-3, 4)$



2. slope =  $-2$ ;  $(0, 5)$



Write an equation in point-slope form for the line with the given slope that contains the given point.

3. slope =  $3$ ;  $(-4, 2)$

\_\_\_\_\_

4. slope =  $-1$ ;  $(6, -1)$

\_\_\_\_\_

Write an equation in slope-intercept form for the line with the given slope that contains the given point.

5. slope =  $-4$ ;  $(1, -3)$

\_\_\_\_\_

6. slope =  $\frac{1}{2}$ ;  $(-8, -5)$

\_\_\_\_\_

Write an equation in slope-intercept form for the line through the two points.

7.  $(2, 1)$ ;  $(0, -7)$

\_\_\_\_\_

8.  $(-6, -6)$ ;  $(2, -2)$

\_\_\_\_\_

9. The cost of internet access at a cafe is a function of time. The costs for 8, 25, and 40 minutes are shown. Write an equation in slope-intercept form that represents the function. Then find the cost of surfing the web at the cafe for one hour.

<b>Time (min)</b>	8	25	40
<b>Cost (\$)</b>	4.36	7.25	9.80

\_\_\_\_\_

**LESSON**  
**5-8**

**Practice B**  
**Slopes of Parallel and Perpendicular Lines**

Identify which lines are parallel.

1.  $y = 3x + 4$ ;  $y = 4$ ;  $y = 3x$ ;  $y = 3$

\_\_\_\_\_

2.  $y = \frac{1}{2}x + 4$ ;  $x = \frac{1}{2}$ ;  $2x + y = 1$ ;  $y = \frac{1}{2}x + 1$

\_\_\_\_\_

3. Find the slope of each segment.

slope of  $\overline{AB}$  : \_\_\_\_\_

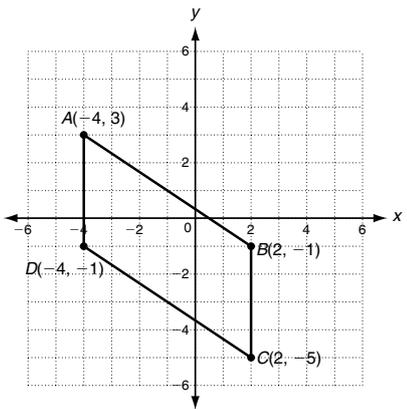
slope of  $\overline{AD}$  : \_\_\_\_\_

slope of  $\overline{DC}$  : \_\_\_\_\_

slope of  $\overline{BC}$  : \_\_\_\_\_

Explain why  $ABCD$  is a parallelogram.

\_\_\_\_\_  
\_\_\_\_\_



Identify which lines are perpendicular.

4.  $y = 5$ ;  $y = \frac{1}{8}x$ ;  $x = 2$ ;  $y = 8x - 5$

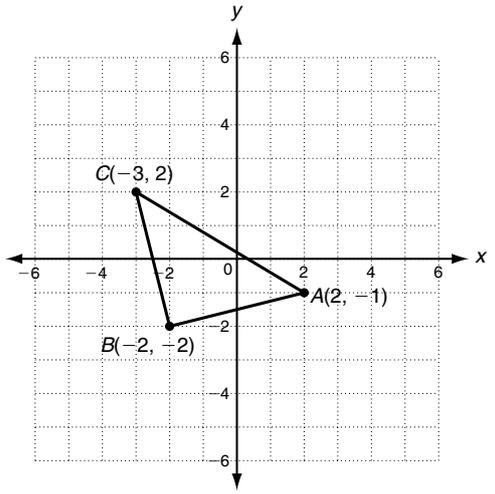
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5.  $y = -2$ ;  $y = -\frac{1}{2}x - 4$ ;  $y - 4 = 2(x + 3)$ ;  $y = -2x$

\_\_\_\_\_

6. Show that  $ABC$  is a right triangle.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
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\_\_\_\_\_



**LESSON** **Practice B**  
**5-9** *Transforming Linear Functions*

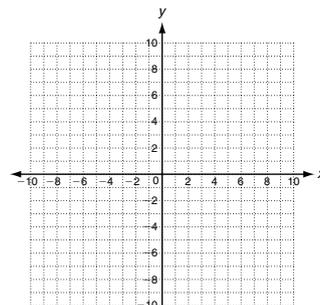
Graph  $f(x)$  and  $g(x)$ . Then describe the transformation from the graph of  $f(x)$  to the graph of  $g(x)$ .

1.  $f(x) = x; g(x) = x + 3$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

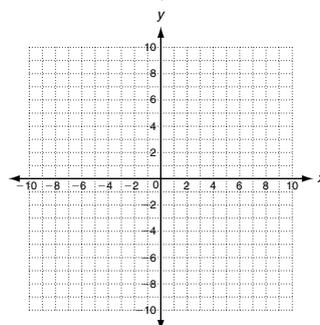


2.  $f(x) = \frac{1}{3}x - 4; g(x) = \frac{1}{4}x - 4$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

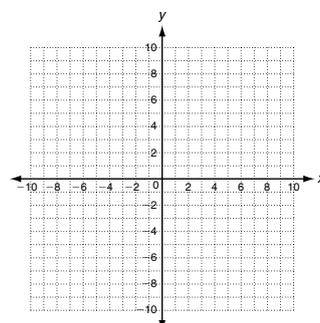


3.  $f(x) = x; g(x) = 2x - 5$

\_\_\_\_\_

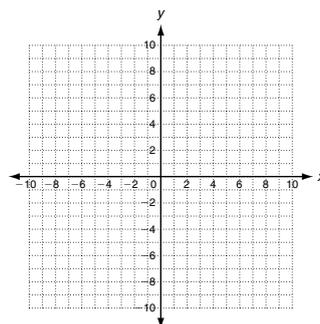
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\_\_\_\_\_



4. Graph  $f(x) = -3x + 1$ . Then reflect the graph of  $f(x)$  across the  $y$ -axis. Write a function  $g(x)$  to describe the new graph.

\_\_\_\_\_



5. The cost of hosting a party at a horse farm is a flat fee of \$250, plus \$5 per person. The total charge for a party of  $x$  people is  $f(x) = 5x + 250$ . How will the graph of this function change if the flat fee is lowered to \$200? if the per-person rate is raised to \$8?

\_\_\_\_\_

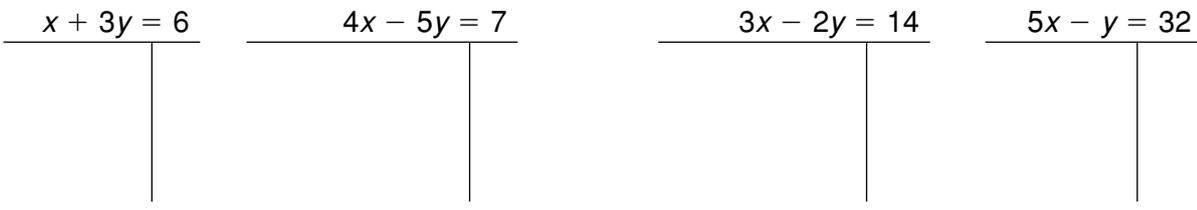
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**LESSON** **Practice B**  
**6-1 Solving Systems by Graphing**

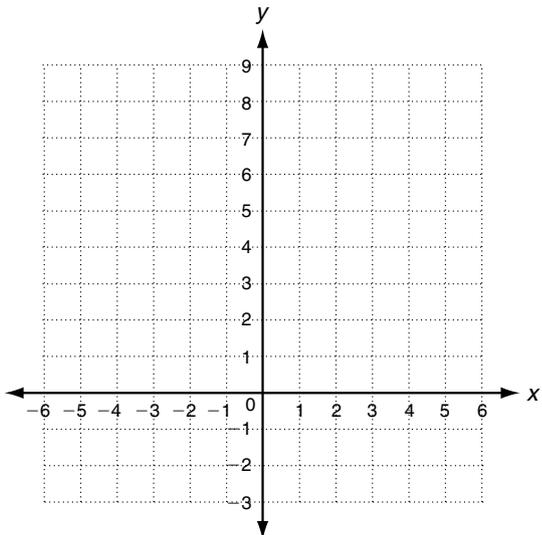
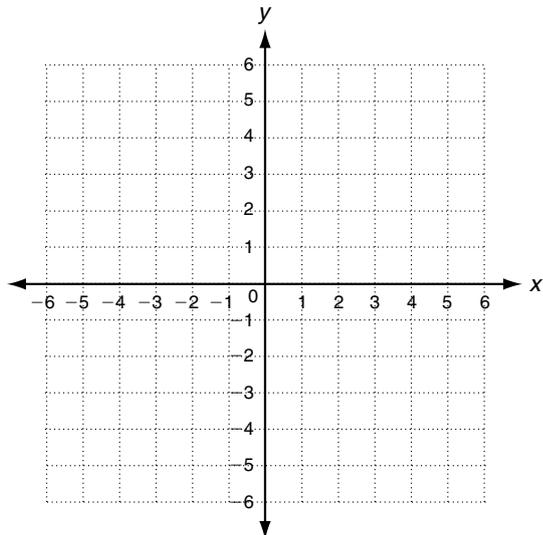
Tell whether the ordered pair is a solution of the given system.

1.  $(3, 1); \begin{cases} x + 3y = 6 \\ 4x - 5y = 7 \end{cases}$  \_\_\_\_\_
2.  $(6, -2); \begin{cases} 3x - 2y = 14 \\ 5x - y = 32 \end{cases}$  \_\_\_\_\_



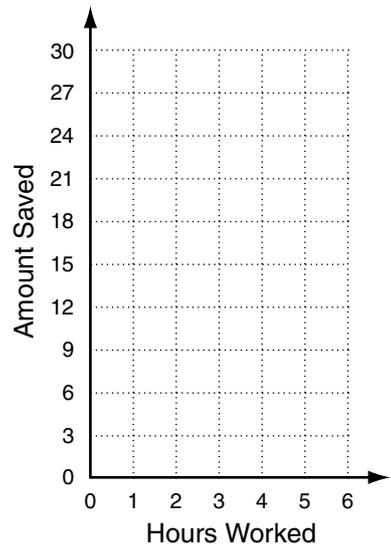
Solve each system by graphing. Check your answer.

3.  $\begin{cases} y = x + 4 \\ y = -2x + 1 \end{cases}$  Solution: \_\_\_\_\_
4.  $\begin{cases} y = x + 6 \\ y = -3x + 6 \end{cases}$  Solution: \_\_\_\_\_



5. Maryann and Carlos are each saving for new scooters. So far, Maryann has \$9 saved, and can earn \$6 per hour babysitting. Carlos has \$3 saved, and can earn \$9 per hour working at his family's restaurant. After how many hours of work will Maryann and Carlos have saved the same amount? What will that amount be?

\_\_\_\_\_



## LESSON

**Practice B****6-2****Solving Systems by Substitution**

Solve each system by substitution. Check your answer.

1. 
$$\begin{cases} y = x - 2 \\ y = 4x + 1 \end{cases}$$

\_\_\_\_\_

2. 
$$\begin{cases} y = x - 4 \\ y = -x + 2 \end{cases}$$

\_\_\_\_\_

3. 
$$\begin{cases} y = 3x + 1 \\ y = 5x - 3 \end{cases}$$

\_\_\_\_\_

4. 
$$\begin{cases} 2x - y = 6 \\ x + y = -3 \end{cases}$$

\_\_\_\_\_

5. 
$$\begin{cases} 2x + y = 8 \\ y = x - 7 \end{cases}$$

\_\_\_\_\_

6. 
$$\begin{cases} 2x + 3y = 0 \\ x + 2y = -1 \end{cases}$$

\_\_\_\_\_

7. 
$$\begin{cases} 3x - 2y = 7 \\ x + 3y = -5 \end{cases}$$

\_\_\_\_\_

8. 
$$\begin{cases} -2x + y = 0 \\ 5x + 3y = -11 \end{cases}$$

\_\_\_\_\_

9. 
$$\begin{cases} \frac{1}{2}x + \frac{1}{3}y = 5 \\ \frac{1}{4}x + y = 10 \end{cases}$$

\_\_\_\_\_

**Write a system of equations to represent the situation. Then, solve the system by substitution.**

10. The length of a rectangle is 3 more than its width. The perimeter of the rectangle is 58 cm. What are the rectangle's dimensions?

\_\_\_\_\_

11. Carla and Benicio work in a men's clothing store. They earn commission from each suit and each pair of shoes they sell. For selling 3 suits and one pair of shoes, Carla has earned \$47 in commission. For selling 7 suits and 2 pairs of shoes, Benicio has earned \$107 in commission. How much do the salespeople earn for the sale of a suit? for the sale of a pair of shoes?

\_\_\_\_\_

**LESSON** **Practice B**  
**6-3 Solving Systems by Elimination**

Follow the steps to solve each system by elimination.

1. 
$$\begin{cases} 2x - 3y = 14 \\ 2x + y = -10 \end{cases}$$

Subtract the second equation:

$$\begin{array}{r} 2x - 3y = 14 \\ -(2x + y = -10) \\ \hline \end{array}$$

Solve the resulting equation:

$y =$  \_\_\_\_\_

Use your answer to find the value of  $x$ :

$x =$  \_\_\_\_\_

Solution: (\_\_\_\_\_, \_\_\_\_\_)

2. 
$$\begin{cases} 3x + y = 17 \\ 4x + 2y = 20 \end{cases}$$

Multiply the first equation by  $-2$ . Then, add the equations:

$$\begin{array}{r} \_\_\_\_\_\_x - \_\_\_\_\_\_y = \_\_\_\_\_\_ \\ + 4x + 2y = 20 \\ \hline \end{array}$$

Solve the resulting equation:

$x =$  \_\_\_\_\_

Use your answer to find the value of  $y$ :

$y =$  \_\_\_\_\_

Solution: (\_\_\_\_\_, \_\_\_\_\_)

Solve each system by elimination. Check your answer.

3. 
$$\begin{cases} x + 3y = -7 \\ -x + 2y = -8 \end{cases}$$

4. 
$$\begin{cases} 3x + y = -26 \\ 2x - y = -19 \end{cases}$$

5. 
$$\begin{cases} x + 3y = -14 \\ 2x - 4y = 32 \end{cases}$$

6. 
$$\begin{cases} 4x - y = -5 \\ -2x + 3y = 10 \end{cases}$$

7. 
$$\begin{cases} y - 3x = 11 \\ 2y - x = 2 \end{cases}$$

8. 
$$\begin{cases} -10x + y = 0 \\ 5x + 3y = -7 \end{cases}$$

**Solve.**

9. Brianna's family spent \$134 on 2 adult tickets and 3 youth tickets at an amusement park. Max's family spent \$146 on 3 adult tickets and 2 youth tickets. What is the price of a youth ticket? \_\_\_\_\_

10. Carl bought 19 apples of 2 different varieties to make a pie. The total cost of the apples was \$5.10. Granny Smith apples cost \$0.25 each and Gala apples cost \$0.30 each. How many of each type of apple did Carl buy? \_\_\_\_\_

## LESSON

**Practice B****6-4****Solving Special Systems**

Solve each system of linear equations.

1. 
$$\begin{cases} y = 2x - 3 \\ y - 2x = -3 \end{cases}$$

2. 
$$\begin{cases} 3x + y = 4 \\ -3x = y - 7 \end{cases}$$

3. 
$$\begin{cases} y = -4x + 1 \\ 4x = -y - 6 \end{cases}$$

4. 
$$\begin{cases} y - x + 3 = 0 \\ x = y + 3 \end{cases}$$

Classify each system. Give the number of solutions.

5. 
$$\begin{cases} y = 3(x - 1) \\ -y + 3x = 3 \end{cases}$$

6. 
$$\begin{cases} y - 2x = 5 \\ x = y - 3 \end{cases}$$

7. Sabina and Lou are reading the same book. Sabina reads 12 pages a day. She had read 36 pages when Lou started the book, and Lou reads at a pace of 15 pages per day. If their reading rates continue, will Sabina and Lou ever be reading the same page on the same day? Explain.

8. Brandon started jogging at 4 miles per hour. After he jogged 1 mile, his friend Anton started jogging along the same path at a pace of 4 miles per hour. If they continue to jog at the same rate, will Anton ever catch up with Brandon? Explain.

**LESSON**  
**6-5**

**Practice B**  
**Solving Linear Inequalities**

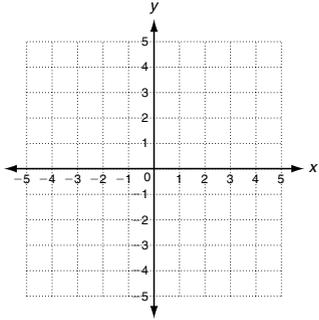
Tell whether the ordered pair is a solution of the given inequality.

1.  $(1, 6)$ ;  $y < x + 6$       2.  $(-3, -12)$ ;  $y \geq 2x - 5$       3.  $(5, -3)$ ;  $y \leq -x + 2$

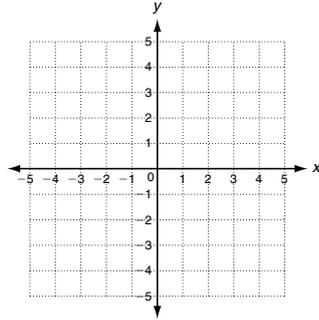
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Graph the solutions of each linear inequality.

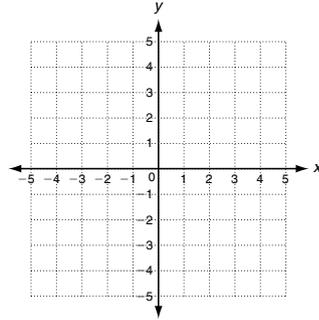
4.  $y \leq x + 4$



5.  $2x + y > -2$



6.  $x + y - 1 < 0$



7. Clark is having a party at his house. His father has allowed him to spend at most \$20 on snack food. He'd like to buy chips that cost \$4 per bag, and pretzels that cost \$2 per bag.

a. Write an inequality to describe the situation.

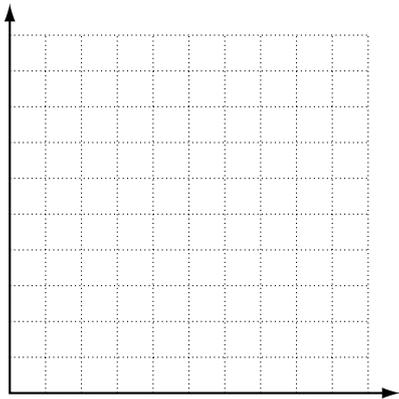
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b. Graph the solutions.

c. Give two possible combinations of bags of chips and pretzels that Clark can buy.

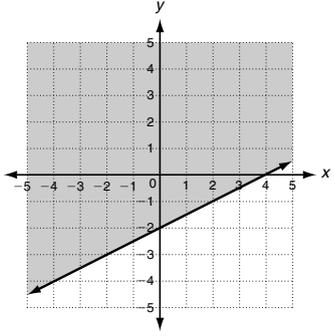
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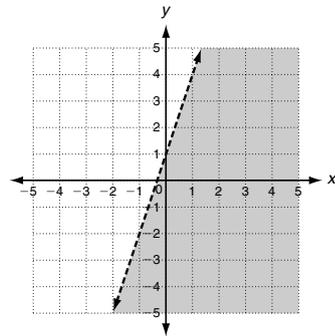


Write an inequality to represent each graph.

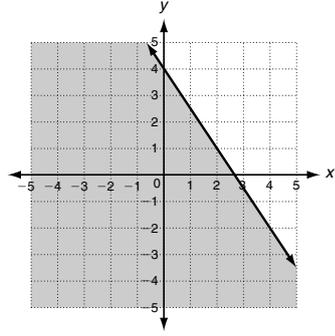
8.



9.



10.



\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**LESSON**  
**6-6**

**Practice B**  
**Solving Systems of Linear Inequalities**

Tell whether the ordered pair is a solution of the given system.

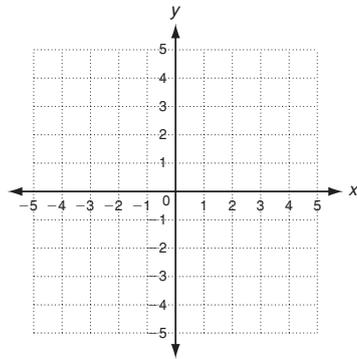
1.  $(2, -2); \begin{cases} y < x - 3 \\ y > -x + 1 \end{cases}$

2.  $(2, 5); \begin{cases} y > 2x \\ y \geq x + 2 \end{cases}$

3.  $(1, 3); \begin{cases} y \leq x + 2 \\ y > 4x - 1 \end{cases}$

Graph the system of linear inequalities. a. Give two ordered pairs that are solutions. b. Give two ordered pairs that are not solutions.

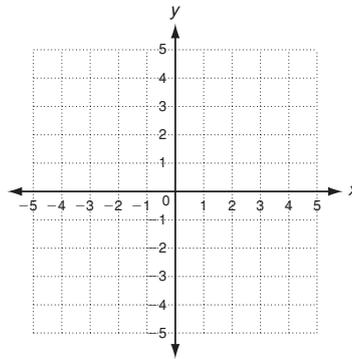
4.  $\begin{cases} y \leq x + 4 \\ y \geq -2x \end{cases}$



a. \_\_\_\_\_

b. \_\_\_\_\_

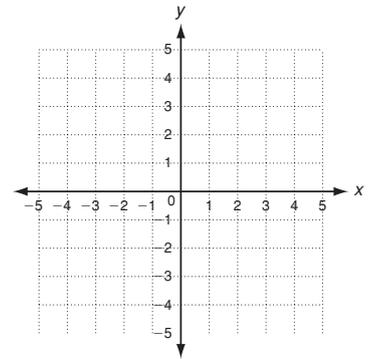
5.  $\begin{cases} y \leq \frac{1}{2}x + 1 \\ x + y < 3 \end{cases}$



a. \_\_\_\_\_

b. \_\_\_\_\_

6.  $\begin{cases} y > x - 4 \\ y < x + 2 \end{cases}$



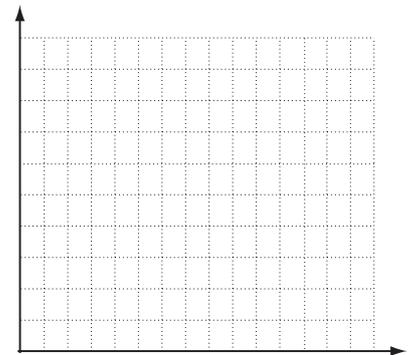
a. \_\_\_\_\_

b. \_\_\_\_\_

7. Charlene makes \$10 per hour babysitting and \$5 per hour gardening. She wants to make at least \$80 a week, but can work no more than 12 hours a week.

a. Write a system of linear equations.

\_\_\_\_\_



b. Graph the solutions of the system.

c. Describe all the possible combinations of hours that Charlene could work at each job.

\_\_\_\_\_  
\_\_\_\_\_

d. List two possible combinations. \_\_\_\_\_

\_\_\_\_\_

**LESSON**

**7-1**

**Practice B**

**Integer Exponents**

**Simplify.**

1.  $5^{-3} = \frac{1}{\quad} = \frac{1}{\quad}$

2.  $2^{-6} = \frac{1}{\quad} = \frac{1}{\quad}$

3.  $(-5)^{-2}$  \_\_\_\_\_

4.  $-(4)^{-3}$  \_\_\_\_\_

5.  $-6^0$  \_\_\_\_\_

6.  $(7)^{-2}$  \_\_\_\_\_

**Evaluate each expression for the given value(s) of the variable(s).**

7.  $d^{-3}$  for  $d = -2$

8.  $a^5b^{-6}$  for  $a = 3$  and  $b = 2$

9.  $(b - 4)^{-2}$  for  $b = 1$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

10.  $5z^{-x}$  for  $z = -3$  and  $x = 2$

11.  $(5z)^{-x}$  for  $z = -3$  and  $x = 2$

12.  $c^{-3}(16^{-2})$  for  $c = 4$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Simplify.**

13.  $t^{-4}$

14.  $3r^{-5}$

15.  $\frac{s^{-3}}{t^{-5}}$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

16.  $\frac{h^0}{3}$

17.  $\frac{2x^{-3}y^{-2}}{z^4}$

18.  $\frac{4fg^{-5}}{5h^{-3}}$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

19.  $\frac{14a^{-4}}{20bc^{-1}}$

20.  $\frac{a^4c^2e^0}{b^{-1}d^{-3}}$

21.  $\frac{-3g^{-2}hk^{-2}}{-6h^0}$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

22. A cooking website claims to contain  $10^5$  recipes.  
Evaluate this expression.

\_\_\_\_\_

23. A ball bearing has diameter  $2^{-3}$  inches.  
Evaluate this expression.

\_\_\_\_\_

**LESSON**  
**7-2 Practice B**  
**Powers of 10 and Scientific Notation**

Find the value of each power of 10.

1.  $10^{-3}$  \_\_\_\_\_      2.  $10^5$  \_\_\_\_\_      3.  $10^{-4}$  \_\_\_\_\_  
 4.  $10^0$  \_\_\_\_\_      5.  $10^7$  \_\_\_\_\_      6.  $10^1$  \_\_\_\_\_

Write each number as a power of 10.

7. 1,000,000 \_\_\_\_\_      8. 0.001 \_\_\_\_\_      9. 0.000001 \_\_\_\_\_  
 10. 0.00001 \_\_\_\_\_      11. 0.1 \_\_\_\_\_      12. 0.00000001 \_\_\_\_\_

Find the value of each expression.

13.  $5.02 \times 10^3$  \_\_\_\_\_      14.  $603 \times 10^{-4}$  \_\_\_\_\_  
 15.  $52.8 \times 10^6$  \_\_\_\_\_      16.  $5.41 \times 10^{-3}$  \_\_\_\_\_  
 17.  $0.03 \times 10^{-2}$  \_\_\_\_\_      18.  $22.81 \times 10^{-6}$  \_\_\_\_\_

Write each number in scientific notation.

19. 4500 \_\_\_\_\_      20. 6,560,000 \_\_\_\_\_  
 21. 0.00002 \_\_\_\_\_      22. 0.00203 \_\_\_\_\_

Order the list of numbers from least to greatest.

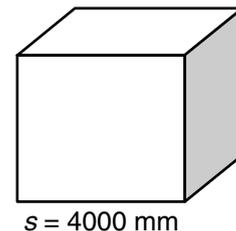
23.  $3 \times 10^2$ ;  $4.54 \times 10^{-3}$ ;  $6.75 \times 10^2$ ;  $8.2 \times 10^{-4}$ ;  $9 \times 10^{-1}$ ;  $6.18 \times 10^{-4}$
- \_\_\_\_\_

24.  $5.4 \times 10^{-3}$ ;  $6.2 \times 10^{-1}$ ;  $7.25 \times 10^3$ ;  $6.87 \times 10^3$ ;  $2.24 \times 10^{-1}$ ;  $6.6 \times 10^{-3}$
- \_\_\_\_\_

25. In 1970, the number of televisions sold in the United States was about  $1.2 \times 10^7$ . Write this number in standard form. \_\_\_\_\_

26. In 1950, about 3,880,000 households in the United States had televisions. Write this number in scientific notation. \_\_\_\_\_

27. Find the volume of the cube shown at right. Write the answer in both standard form and in scientific notation.
- \_\_\_\_\_
- \_\_\_\_\_



## LESSON

**Practice B****7-3****Multiplication Properties of Exponents**

Simplify.

1.  $3^4 \cdot 3^2$   
\_\_\_\_\_

2.  $2^5 \cdot 2^4$   
\_\_\_\_\_

3.  $2^3 \cdot 2^5 \cdot 2^1$   
\_\_\_\_\_

4.  $q^{-6} \cdot q^{-1}$   
\_\_\_\_\_

5.  $r^{-3} \cdot r^4 \cdot s^{-4}$   
\_\_\_\_\_

6.  $j^{-2} \cdot j^{-4} \cdot j^2$   
\_\_\_\_\_

7.  $c^5 \cdot b^{-2} \cdot c^3$   
\_\_\_\_\_

8.  $(h^2)^5$   
\_\_\_\_\_

9.  $(g^4)^{-2}$   
\_\_\_\_\_

10.  $(w^6)^0$   
\_\_\_\_\_

11.  $(v^2)^5 \cdot v^4$   
\_\_\_\_\_

12.  $(w^5)^{-2} \cdot w^{-3}$   
\_\_\_\_\_

13.  $(f^6)^{-4} \cdot (f^{-2})^{-3}$   
\_\_\_\_\_

14.  $(a^{-2})^{-3} \cdot (a^5)^2$   
\_\_\_\_\_

15.  $(3b)^4$   
\_\_\_\_\_

16.  $(-5k)^2$   
\_\_\_\_\_

17.  $-(4m)^3$   
\_\_\_\_\_

18.  $(-3p)^{-2}$   
\_\_\_\_\_

19.  $(s^4 t)^3 \cdot (s^4 t^3)^2$   
\_\_\_\_\_

20.  $(a^2 b^4)^2 \cdot (a^{-2} b^3)^{-1} \cdot a^4$

21.  $(x^3 y^2)^{-4} \cdot (x^2 y^{-3})^{-2}$   
\_\_\_\_\_

22. The pitch of a sound is determined by the number of vibrations produced per second. The note "middle C" produces  $2.62 \times 10^2$  vibrations per second. If a pianist plays middle C for  $5 \times 10^{-1}$  seconds, how many vibrations will occur?
- \_\_\_\_\_

**LESSON**

**Practice B**

**7-4** *Division Properties of Exponents*

**Simplify.**

1.  $\frac{6^7}{6^5} = 6^{7-5} = 6^{\square} =$  \_\_\_\_\_

2.  $\frac{t^{12}}{t^7} = t^{\square} - \square =$  \_\_\_\_\_

3.  $\frac{w^9}{w^2}$

4.  $\frac{j^2}{j^8}$

5.  $\frac{20m^5}{4m^2}$

6.  $\frac{c^3 d^2}{c^2 d^5}$

7.  $\frac{(x^4)^2}{(x^3)^5}$

8.  $\left(\frac{s^3 t}{st^4}\right)^2$

9.  $\left(\frac{2}{3}\right)^{-3}$

10.  $\left(\frac{3a}{2b}\right)^{-4}$

11.  $-\left(\frac{-t}{3v}\right)^{-4}$

12.  $\left(\frac{6}{7}\right)^{-2} \cdot \left(\frac{4s}{6t}\right)^{-2}$

13.  $\left(\frac{3c}{-2}\right)^{-1} \left(\frac{d}{4}\right)^{-2}$

14.  $\left(\left(\frac{3mn}{2}\right)^{-1}\right)^{-4}$

**Simplify. Write the answer in scientific notation.**

15.  $(3.8 \times 10^5) \div (1.9 \times 10^{-6})$

16.  $(2.5 \times 10^3) \div (5 \times 10^{-4})$

17. A textile factory produces  $1.08 \times 10^8$  yards of fabric every year. If the factory is in operation 360 days a year, what is the average number of yards of fabric produced each day? Give your answer in standard form.

18. It takes 5 yards of fabric to manufacture a dress. If the textile factory turned their entire yearly production of  $1.08 \times 10^8$  yards of fabric into dresses, how many could they make? Give your answer in scientific notation.

**LESSON**  
**7-5** **Practice B**  
**Polynomials**

Find the degree and number of terms of each polynomial.

1.  $14h^3 + 2h + 10$

\_\_\_\_\_

\_\_\_\_\_

2.  $7y - 10y^2$

\_\_\_\_\_

\_\_\_\_\_

3.  $2a^2 - 5a + 34 - 6a^4$

\_\_\_\_\_

\_\_\_\_\_

Write each polynomial in standard form. Then, give the leading coefficient.

4.  $3x^2 - 2 + 4x^8 - x$

\_\_\_\_\_

5.  $7 + 50j - 3j^3 - 4j^2$

\_\_\_\_\_

6.  $6k + 5k^4 - 4k^3 + 3k^2$

\_\_\_\_\_

Classify each polynomial by its degree and number of terms.

7.  $-5t^2 + 10$

\_\_\_\_\_

\_\_\_\_\_

8.  $8w + 32 + 9w^4$

\_\_\_\_\_

\_\_\_\_\_

9.  $b - b^3 - 2b^2 + 5b^4$

\_\_\_\_\_

\_\_\_\_\_

Evaluate each polynomial for the given value.

10.  $3m + 8 - 2m^3$  for  $m = -1$

\_\_\_\_\_

11.  $4y^5 - 6y + 8y^2 - 1$  for  $y = -1$

\_\_\_\_\_

12.  $2w + w^3 - \frac{1}{2}w^2$  for  $w = 2$

\_\_\_\_\_

13. An egg is thrown off the top of a building. Its height in meters above the ground can be approximated by the polynomial  $300 + 2t - 4.9t^2$ , where  $t$  is the time since it was thrown in seconds.

a. How high is the egg above the ground after 5 seconds?

\_\_\_\_\_

b. How high is the egg above the ground after 6 seconds?

\_\_\_\_\_

**LESSON**  
**7-6**

**Practice B**  
**Adding and Subtracting Polynomials**

**Add or subtract.**

1.  $3m^3 + 8m^3 - 3 + m^3 - 2m^2$  \_\_\_\_\_
2.  $2pg - p^5 - 12pg + 5g - 6p^5$  \_\_\_\_\_

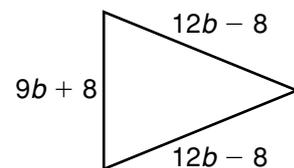
**Add.**

3. 
$$\begin{array}{r} 3k^2 - 2k + 7 \\ + \quad k - 2 \\ \hline \end{array}$$
 \_\_\_\_\_
4. 
$$\begin{array}{r} 5x^2 - 2x + 3y \\ + 6x^2 + 5x + 6y \\ \hline \end{array}$$
 \_\_\_\_\_
5. 
$$\begin{array}{r} 11hz^3 + 3hz^2 + 8hz \\ + 9hz^3 + hz^2 - 3hz \\ \hline \end{array}$$
 \_\_\_\_\_
6.  $(ab^2 + 13b - 4a) + (3ab^2 + a + 7b)$  \_\_\_\_\_
7.  $(4x^3 - x^2 + 4x) + (x^3 - x^2 - 4x)$  \_\_\_\_\_

**Subtract.**

8. 
$$\begin{array}{r} 12d^2 + 3dx + x \\ - (-4d^2 + 2dx - 8x) \\ \hline \end{array}$$
 \_\_\_\_\_
9. 
$$\begin{array}{r} 2v^5 - 3v^4 - 8 \\ - (3v^5 + 2v^4 - 8) \\ \hline \end{array}$$
 \_\_\_\_\_
10. 
$$\begin{array}{r} -y^4 + 6ay^2 - y + a \\ - (-6y^4 - 2ay^2 + y) \\ \hline \end{array}$$
 \_\_\_\_\_
11.  $(-r^2 + 8pr - p) - (-12r^2 - 2pr + 8p)$  \_\_\_\_\_
12.  $(un - n^2 + 2un^3) - (3un^3 + n^2 + 4un)$  \_\_\_\_\_

13. Antoine is making a banner in the shape of a triangle. He wants to line the banner with a decorative border. How long will the border be?



14. Darnell and Stephanie have competing refreshment stand businesses. Darnell's profit can be modeled with the polynomial  $c^2 + 8c - 100$ , where  $c$  is the number of items sold. Stephanie's profit can be modeled with the polynomial  $2c^2 - 7c - 200$ .
- a. Write a polynomial that represents the difference between Stephanie's profit and Darnell's profit.
- \_\_\_\_\_
- b. Write a polynomial to show how much they can expect to earn if they decided to combine their businesses.
- \_\_\_\_\_

**LESSON**

**7-7**

**Practice B**

**Multiplying Polynomials**

**Multiply.**

1.  $(6m^4)(8m^2)$

\_\_\_\_\_

2.  $(5x^3)(4xy^2)$

\_\_\_\_\_

3.  $(10s^5t)(7st^4)$

\_\_\_\_\_

4.  $4(x^2 + 5x + 6)$

\_\_\_\_\_

5.  $2x(3x - 4)$

\_\_\_\_\_

6.  $7xy(3x^2 + 4y + 2)$

\_\_\_\_\_

7.  $(x + 3)(x + 4)$

\_\_\_\_\_

8.  $(x - 6)(x - 6)$

\_\_\_\_\_

9.  $(x - 2)(x - 5)$

\_\_\_\_\_

10.  $(2x + 5)(x + 6)$

\_\_\_\_\_

11.  $(m^2 + 3)(5m + n)$

\_\_\_\_\_

12.  $(a^2 + b^2)(a + b)$

\_\_\_\_\_

13.  $(x + 4)(x^2 + 3x + 5)$

\_\_\_\_\_

14.  $(3m + 4)(m^2 - 3m + 5)$

\_\_\_\_\_

15.  $(2x - 5)(4x^2 - 3x + 1)$

\_\_\_\_\_

**16. The length of a rectangle is 3 inches greater than the width.**

a. Write a polynomial that represents the area of the rectangle.

\_\_\_\_\_

b. Find the area of the rectangle when the width is 4 inches.

\_\_\_\_\_

**17. The length of a rectangle is 8 centimeters less than 3 times the width.**

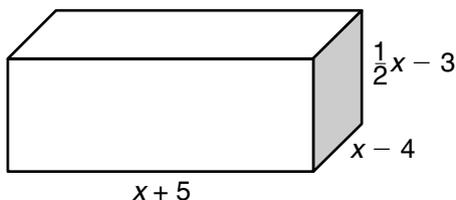
a. Write a polynomial that represents the area of the rectangle.

\_\_\_\_\_

b. Find the area of the rectangle when the width is 10 centimeters.

\_\_\_\_\_

**18. Write a polynomial to represent the volume of the rectangular prism.**



\_\_\_\_\_

**LESSON**  
**7-8**

**Practice B**  
**Special Products of Binomials**

**Multiply.**

1.  $(x + 2)^2$

\_\_\_\_\_

2.  $(m + 4)^2$

\_\_\_\_\_

3.  $(3 + a)^2$

\_\_\_\_\_

4.  $(2x + 5)^2$

\_\_\_\_\_

5.  $(3a + 2)^2$

\_\_\_\_\_

6.  $(6 + 5b)^2$

\_\_\_\_\_

7.  $(b - 3)^2$

\_\_\_\_\_

8.  $(8 - y)^2$

\_\_\_\_\_

9.  $(a - 10)^2$

\_\_\_\_\_

10.  $(3x - 7)^2$

\_\_\_\_\_

11.  $(4m - 9)^2$

\_\_\_\_\_

12.  $(6 - 3n)^2$

\_\_\_\_\_

13.  $(x + 3)(x - 3)$

\_\_\_\_\_

14.  $(8 + y)(8 - y)$

\_\_\_\_\_

15.  $(x + 6)(x - 6)$

\_\_\_\_\_

16.  $(5x + 2)(5x - 2)$

\_\_\_\_\_

17.  $(10x + 7y)(10x - 7y)$

\_\_\_\_\_

18.  $(x^2 + 3y)(x^2 - 3y)$

\_\_\_\_\_

19. Write a simplified expression that represents the...

a. area of the large rectangle.

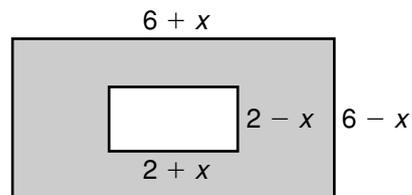
\_\_\_\_\_

b. area of the small rectangle.

\_\_\_\_\_

c. area of the shaded area.

\_\_\_\_\_



20. The small rectangle is made larger by adding 2 units to the length and 2 units to the width.

a. What is the new area of the smaller rectangle?

\_\_\_\_\_

b. What is the area of the new shaded area?

\_\_\_\_\_

**LESSON**

**Practice B**

**8-1 Factors and Greatest Common Factors**

Write the prime factorization of each number.

1. 18

2. 120

3. 56

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4. 390

5. 144

6. 153

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Find the GCF of each pair of numbers.

7. 16 and 20

\_\_\_\_\_

8. 9 and 36

\_\_\_\_\_

9. 15 and 28

\_\_\_\_\_

10. 35 and 42

\_\_\_\_\_

11. 33 and 66

\_\_\_\_\_

12. 100 and 120

\_\_\_\_\_

13. 78 and 30

\_\_\_\_\_

14. 84 and 42

\_\_\_\_\_

Find the GCF of each pair of monomials.

15.  $15x^4$  and  $35x^2$

\_\_\_\_\_

16.  $12p^2$  and  $30q^5$

\_\_\_\_\_

17.  $-6t^3$  and  $9t$

\_\_\_\_\_

18.  $27y^3z$  and  $45x^2y$

\_\_\_\_\_

19.  $12ab$  and  $12$

\_\_\_\_\_

20.  $-8d^3$  and  $14d^4$

\_\_\_\_\_

21.  $-m^8n^4$  and  $3m^6n$

\_\_\_\_\_

22.  $10gh^2$  and  $5h$

\_\_\_\_\_

23. Kirstin is decorating her bedroom wall with photographs. She has 36 photographs of family and 28 photographs of friends. She wants to arrange the photographs in rows so that each row has the same number of photographs, and photographs of family and photographs of friends do not appear in the same row.

a. How many rows will there be if Kirstin puts the greatest possible number of photographs in each row?

\_\_\_\_\_

b. How many photographs will be in each row?

\_\_\_\_\_

## LESSON

**Practice B****8-2****Factoring by GCF**

Factor each polynomial. Check your answer.

1.  $x^2 + 5x$

$x(\underline{\quad} + \underline{\quad})$

2.  $5m^3 + 45$

$\underline{\quad}(\underline{\quad} + 9)$

3.  $15y^3 + 20y^5 - 10$

$\underline{\quad}(3y^3 + 4\underline{\quad} - \underline{\quad})$

4.  $10y^2 + 12y^3$

5.  $-12t^5 + 6t$

6.  $6x^4 + 15x^3 + 3x^2$

7. A golf ball is hit upward at a speed of 40 m/s. The expression  $-5t^2 + 40t$  gives the approximate height of the ball after  $t$  seconds. Factor this expression.

8. The area of the Hillen family's television screen is  $3x^2 + 24x$  in<sup>2</sup>. Factor this polynomial to find expressions for the dimensions of their TV screen.

Factor out the common binomial factor in each expression.

9.  $4d(d + 2) + 9(d + 2)$

10.  $12(x - 5) + 7x(x - 5)$

Factor each polynomial by grouping.

11.  $n^3 + 3n^2 + 4n + 12$

$(n^3 + \underline{\quad}) + (4n + \underline{\quad})$

$n^2(n + \underline{\quad}) + 4(n + \underline{\quad})$

12.  $2x^3 + 5x^2 + 2x + 5$

Factor each polynomial by grouping and using opposites.

13.  $2y^3 - 4y^2 + 6 - 3y$

$(\underline{\quad} - 4y^2) + (\underline{\quad} - 3y)$

$2y^2(\underline{\quad} - 2) + 3(\underline{\quad} - y)$

$2y^2(\underline{\quad} - 2) + 3(-1)(\underline{\quad} - 2)$

$2y^2(\underline{\quad} - 2) - 3(y - \underline{\quad})$

14.  $4m^3 - 12m^2 + 15 - 5m$

**LESSON**

**8-3**

**Practice B**

**Factoring  $x^2 + bx + c$**

Factor each trinomial.

1.  $x^2 + 7x + 10$

2.  $x^2 + 9x + 8$

3.  $x^2 + 13x + 36$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4.  $x^2 + 9x + 14$

5.  $x^2 + 7x + 12$

6.  $x^2 + 9x + 18$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

7.  $x^2 - 9x + 18$

8.  $x^2 - 5x + 4$

9.  $x^2 - 9x + 20$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

10.  $x^2 - 12x + 20$

11.  $x^2 - 11x + 18$

12.  $x^2 - 12x + 32$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

13.  $x^2 + 7x - 18$

14.  $x^2 + 10x - 24$

15.  $x^2 + 2x - 3$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

16.  $x^2 + 2x - 15$

17.  $x^2 + 5x - 6$

18.  $x^2 + 5x - 24$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

19.  $x^2 - 5x - 6$

20.  $x^2 - 2x - 35$

21.  $x^2 - 7x - 30$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

22.  $x^2 - x - 56$

23.  $x^2 - 2x - 8$

24.  $x^2 - x - 20$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

25. Factor  $n^2 + 5n - 24$ . Show that the original polynomial and the factored form describe the same sequence of numbers for  $n = 0, 1, 2, 3,$  and  $4$ .

$n$	$n^2 + 5n - 24$

$n$	

## LESSON

**Practice B****8-4****Factoring  $ax^2 + bx + c$** 

Factor each trinomial.

1.  $2x^2 + 13x + 15$   
\_\_\_\_\_

2.  $3x^2 + 10x + 8$   
\_\_\_\_\_

3.  $4x^2 + 24x + 27$   
\_\_\_\_\_

4.  $5x^2 + 21x + 4$   
\_\_\_\_\_

5.  $4x^2 + 11x + 7$   
\_\_\_\_\_

6.  $6x^2 - 23x + 20$   
\_\_\_\_\_

7.  $7x^2 - 59x + 24$   
\_\_\_\_\_

8.  $3x^2 - 14x + 15$   
\_\_\_\_\_

9.  $8x^2 - 73x + 9$   
\_\_\_\_\_

10.  $2x^2 + 11x - 13$   
\_\_\_\_\_

11.  $3x^2 + 2x - 16$   
\_\_\_\_\_

12.  $2x^2 + 17x - 30$   
\_\_\_\_\_

13.  $8x^2 + 29x - 12$   
\_\_\_\_\_

14.  $11x^2 + 25x - 24$   
\_\_\_\_\_

15.  $9x^2 - 3x - 2$   
\_\_\_\_\_

16.  $12x^2 - 7x - 12$   
\_\_\_\_\_

17.  $9x^2 - 49x - 30$   
\_\_\_\_\_

18.  $6x^2 + x - 40$   
\_\_\_\_\_

19.  $-12x^2 - 35x - 18$   
\_\_\_\_\_

20.  $-20x^2 + 29x - 6$   
\_\_\_\_\_

21.  $-2x^2 + 5x + 42$   
\_\_\_\_\_

22. The area of a rectangle is  $20x^2 - 27x - 8$ .  
The length is  $4x + 1$ . What is the width?  
\_\_\_\_\_

## LESSON

**Practice B****8-5** *Factoring Special Products*

Determine whether each trinomial is a perfect square. If so, factor it.  
If not, explain why.

1.  $x^2 + 6x + 9$   
\_\_\_\_\_

2.  $4x^2 + 20x + 25$   
\_\_\_\_\_

3.  $36x^2 - 24x + 16$   
\_\_\_\_\_

4.  $9x^2 - 12x + 4$   
\_\_\_\_\_

5. A rectangular fountain in the center of a shopping mall has an area of  $(4x^2 + 12x + 9)$  ft<sup>2</sup>. The dimensions of the fountain are of the form  $cx + d$ , where  $c$  and  $d$  are whole numbers. Find an expression for the perimeter of the fountain. Find the perimeter when  $x = 2$  ft.
- 
- \_\_\_\_\_

Determine whether each binomial is the difference of two squares. If so, factor it. If not, explain why.

6.  $x^2 - 16$   
\_\_\_\_\_

7.  $9b^4 - 200$   
\_\_\_\_\_

8.  $1 - m^6$   
\_\_\_\_\_

9.  $36s^2 - 4t^2$   
\_\_\_\_\_

10.  $x^2y^2 + 196$   
\_\_\_\_\_

## LESSON

**Practice B****8-6****Choosing a Factoring Method**

Tell whether each polynomial is completely factored. If not, factor it.

1.  $6(t^2 + 12)$

\_\_\_\_\_

2.  $5(m^2 + 9m)$

\_\_\_\_\_

3.  $2p(p^4 - 9)$

\_\_\_\_\_

4.  $(x - 8)(2x + 3)$

\_\_\_\_\_

5.  $3k^3(5k^2 + 19)$

\_\_\_\_\_

6.  $7(14g^4 - 4g + 10)$

\_\_\_\_\_

Factor each polynomial completely.

7.  $24x + 40$

\_\_\_\_\_

8.  $5r^3 - 10r$

\_\_\_\_\_

9.  $3x^3y + x^2y^2$

\_\_\_\_\_

10.  $-3a^2b + 12ab - 12b$

\_\_\_\_\_

11.  $5t^3 - 45t + 3t^2 - 27$

\_\_\_\_\_

12.  $2y^2 - 6y - 56$

\_\_\_\_\_

13.  $6a^3 + 39a^2 + 45a$

\_\_\_\_\_

14.  $x^3 - 9x$

\_\_\_\_\_

15.  $12n^3 - 48$

\_\_\_\_\_

16.  $3c^4 + 24c^3 + 48c^2$

\_\_\_\_\_

17.  $3d^3 + 4d - 2$

\_\_\_\_\_

18.  $10w^6 - 160w^2$

\_\_\_\_\_

**LESSON** **Practice B**  
**9-1** *Identifying Quadratic Functions*

Tell whether each function is quadratic. Explain.

1. (0, 6), (1, 12), (2, 20), (3, 30)

2.  $3x + 2y = 8$

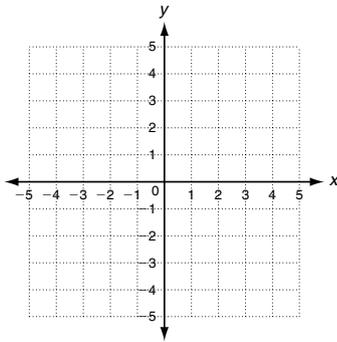
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Use a table of values to graph each quadratic function.

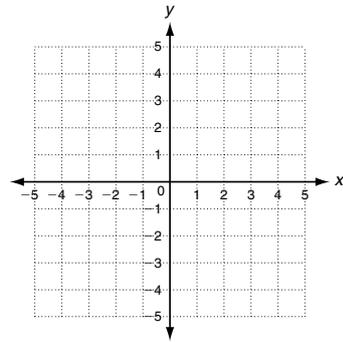
3.  $y = -\frac{1}{2}x^2$

x	y



4.  $y = 2x^2 - 3$

x	y



Tell whether the graph of each quadratic function opens upward or downward. Explain.

5.  $y = -3x^2 + 5$

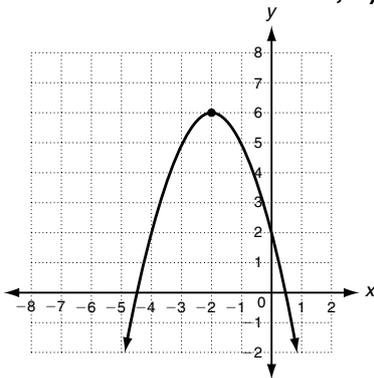
6.  $-x^2 + y = 8$

\_\_\_\_\_

\_\_\_\_\_

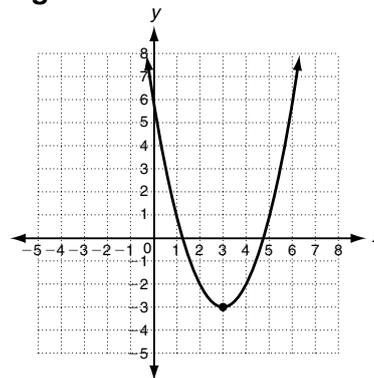
For each parabola, a) identify the vertex; b) give the minimum or maximum value of the function; c) find the domain and range.

7.



- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_

8.

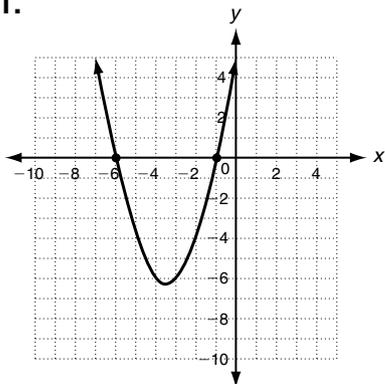


- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_

**LESSON** **9-2** **Practice B**  
**Characteristics of Quadratic Functions**

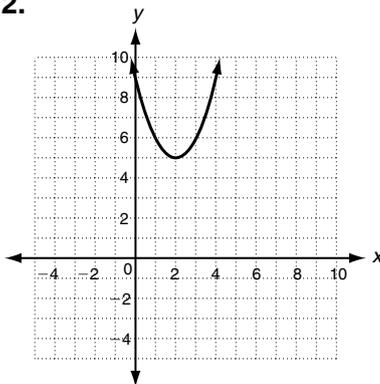
Find the zeros of each quadratic function from its graph.

1.



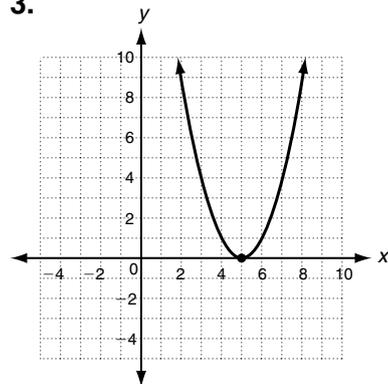
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2.



\_\_\_\_\_

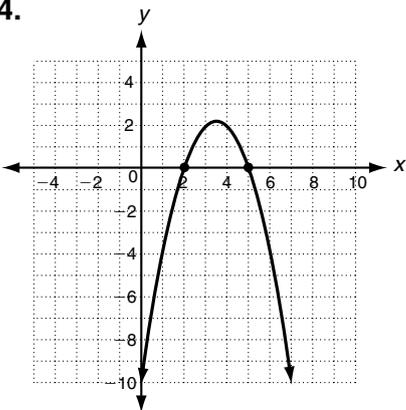
3.



\_\_\_\_\_

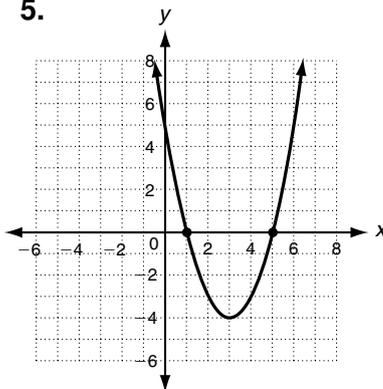
Find the axis of symmetry of each parabola.

4.



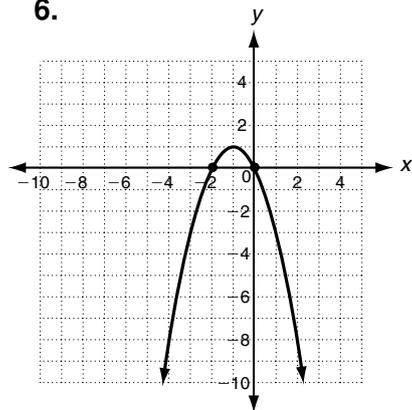
\_\_\_\_\_

5.



\_\_\_\_\_

6.



\_\_\_\_\_

For each quadratic function, find the axis of symmetry of its graph.

7.  $y = 3x^2 - 6x + 4$

\_\_\_\_\_

8.  $y = -x^2 + 4x$

\_\_\_\_\_

9.  $y = 4x^2 + \frac{1}{2}x + 3$

\_\_\_\_\_

Find the vertex of each parabola.

10.  $y = 3x^2 - 6x - 2$

\_\_\_\_\_

11.  $y = 3x^2 + 12x - 10$

\_\_\_\_\_

12.  $y = x^2 + 2x - 35$

\_\_\_\_\_

**LESSON** **Practice B**  
**9-3** **Graphing Quadratic Functions**

Graph each quadratic function.

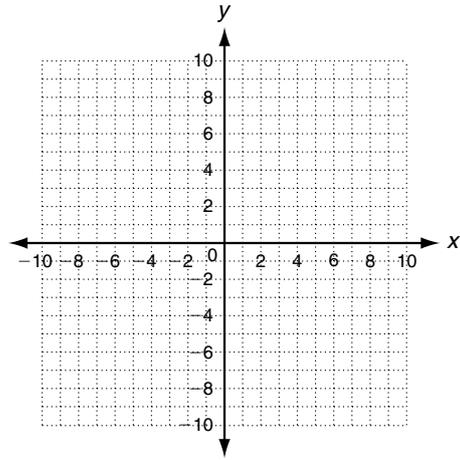
1.  $y = x^2 + 4x - 4$

axis of symmetry: \_\_\_\_\_

vertex: \_\_\_\_\_

y-intercept: \_\_\_\_\_

two other points: \_\_\_\_\_



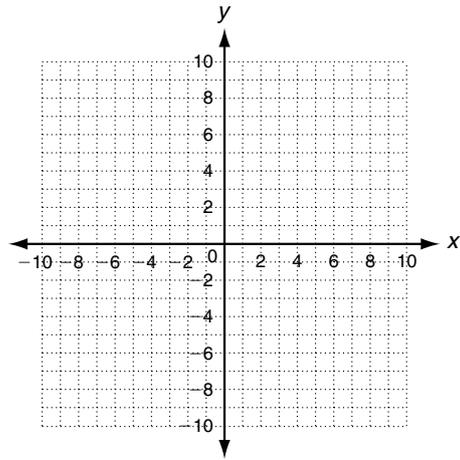
2.  $y + 2x^2 - 4x - 6 = 0$

axis of symmetry: \_\_\_\_\_

vertex: \_\_\_\_\_

y-intercept: \_\_\_\_\_

two other points: \_\_\_\_\_

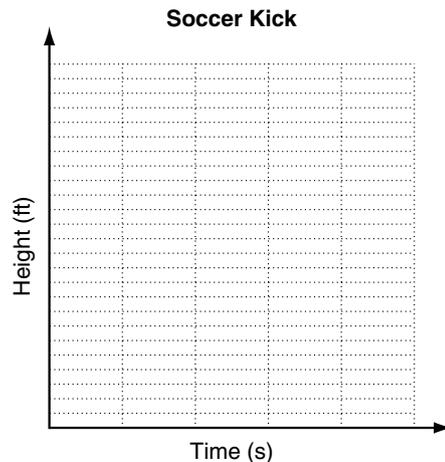


3. The height in feet of a soccer ball that is kicked can be modeled by the function  $f(x) = -8x^2 + 24x$ , where  $x$  is the time in seconds after it is kicked. Find the soccer ball's maximum height and the time it takes the ball to reach this height. Then find how long the soccer ball is in the air.

maximum height: \_\_\_\_\_

time to reach maximum height: \_\_\_\_\_

time in the air: \_\_\_\_\_



**LESSON**  
**9-4** **Practice B**  
**Transforming Quadratic Functions**

Order the functions from narrowest graph to widest.

1.  $f(x) = 3x^2$ ;  $g(x) = -2x^2$

2.  $f(x) = \frac{1}{2}x^2$ ;  $g(x) = 5x^2$ ;  $h(x) = x^2$

\_\_\_\_\_

\_\_\_\_\_

3.  $f(x) = 4x^2$ ;  $g(x) = -3x^2$ ;  $h(x) = \frac{1}{4}x^2$

4.  $f(x) = 0.5x^2$ ;  $g(x) = \frac{1}{4}x^2$ ;  $h(x) = \frac{1}{3}x^2$

\_\_\_\_\_

\_\_\_\_\_

Compare the graph of each function with the graph of  $f(x) = x^2$ .

5.  $g(x) = 5x^2 + 10$  \_\_\_\_\_

\_\_\_\_\_

6.  $g(x) = \frac{1}{8}x^2 - 3$  \_\_\_\_\_

\_\_\_\_\_

7.  $g(x) = -3x^2 + 8$  \_\_\_\_\_

\_\_\_\_\_

8.  $g(x) = -\frac{3}{4}x^2 + \frac{1}{4}$  \_\_\_\_\_

\_\_\_\_\_

9. Two sandbags are dropped from a hot air balloon, one from a height of 400 feet and the other from a height of 1600 feet.

a. Write the two height functions.

$h_1(t) =$  \_\_\_\_\_  $h_2(t) =$  \_\_\_\_\_

b. Sketch and compare their graphs.

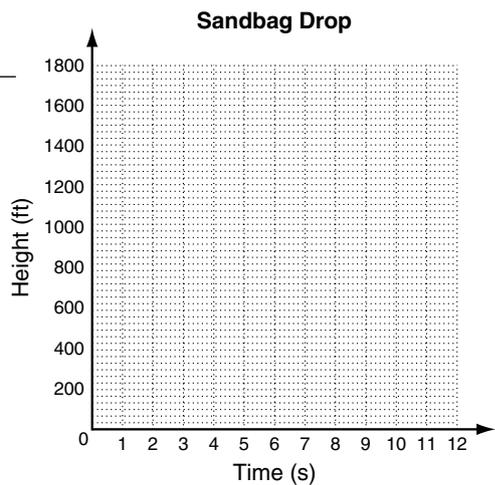
\_\_\_\_\_

\_\_\_\_\_

c. Tell when each sandbag reaches the ground.

\_\_\_\_\_

\_\_\_\_\_

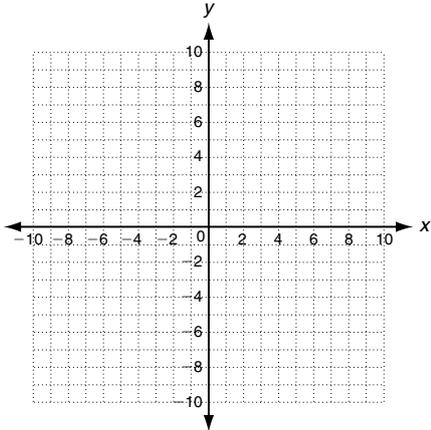


**LESSON**  
**9-5**

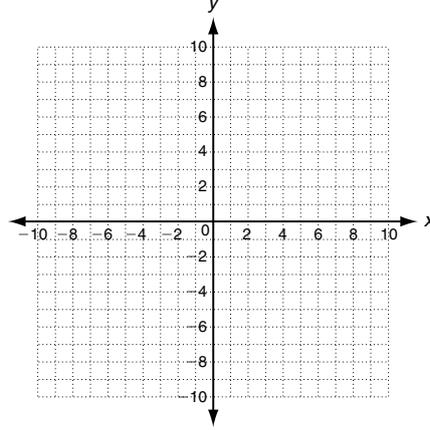
**Practice B**  
**Solving Quadratic Equations by Graphing**

Solve each equation by graphing the related function.

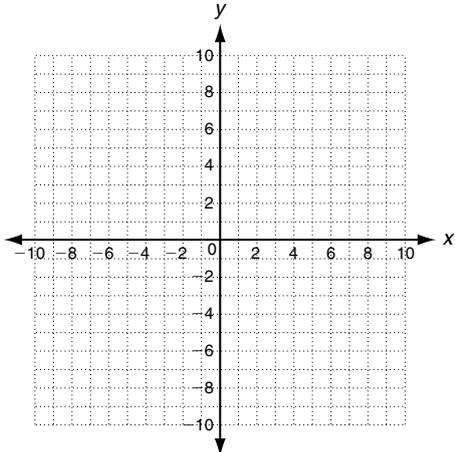
1.  $x^2 - 6x + 9 = 0$



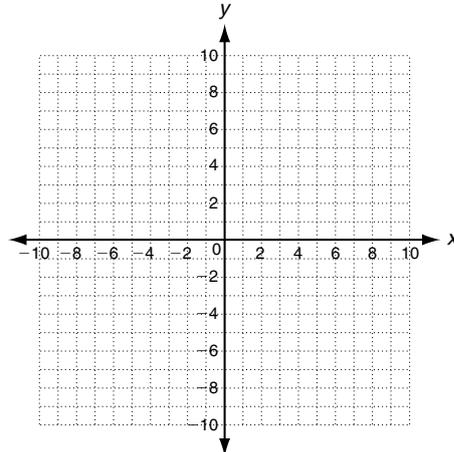
2.  $x^2 = 4$



3.  $2x^2 + 4x = 6$

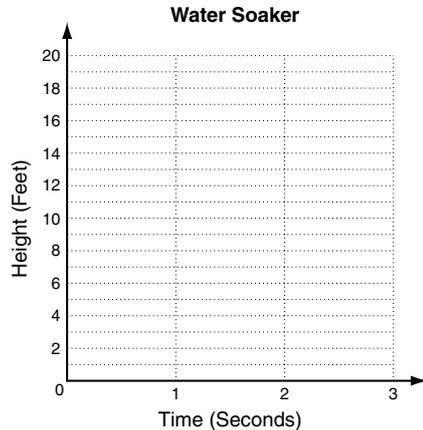


4.  $x^2 = 5x - 10$



5. Water is shot straight up out of a water soaker toy. The quadratic function  $y = -16x^2 + 32x$  models the height in feet of a water droplet after  $x$  seconds. How long is the water droplet in the air?

\_\_\_\_\_



## LESSON

**Practice B****9-6****Solving Quadratic Equations by Factoring**

Use the Zero Product Property to solve each equation. Check your answers.

1.  $(x - 1)(x - 5) = 0$

$$x - 1 = 0 \quad \text{or} \quad x - 5 = 0$$

$$x = \underline{\quad} \quad \text{or} \quad x = \underline{\quad}$$

2.  $(x - 2)(x - 9) = 0$

$$x - 2 = 0 \quad \text{or} \quad x - 9 = 0$$

$$x = \underline{\quad} \quad \text{or} \quad x = \underline{\quad}$$

3.  $(x - 2)(x + 4) = 0$

4.  $(2x + 1)(x - 6) = 0$

Solve each quadratic equation by factoring.

5.  $x^2 - 3x = 0$

6.  $x^2 + 4x + 3 = 0$

7.  $x^2 + 5x - 6 = 0$

8.  $x^2 + 11x + 24 = 0$

9.  $x^2 - 12x + 11 = 0$

10.  $x^2 + 18x - 65 = 0$

11.  $x^2 - 4x - 12 = 0$

12.  $x^2 + 11x + 10 = 0$

13.  $x^2 + 12x + 35 = 0$

14.  $2x^2 - 3x - 5 = 0$

15.  $3x^2 - 5x - 2 = 0$

16.  $x^2 = 3x + 40$

17.  $x^2 - 14 = 5x$

18.  $2x - 1 = -8x^2$

19.  $x = 10x^2 - 2$

20.  $2x^2 = 13x + 7$

21.  $6x^2 + x = 5$

22.  $x^2 = 5x$

23. The height of a flare fired from the deck of a ship in distress can be modeled by  $h = -16t^2 + 104t + 56$ , where  $h$  is the height of the flare above water and  $t$  is the time in seconds. Find the time it takes the flare to hit the water.
- \_\_\_\_\_

**LESSON**  
**9-7**

**Practice B**

**Solving Quadratic Equations by Using Square Roots**

Solve using square roots. Check your answer.

1.  $x^2 = 81$

$x = \pm\sqrt{81}$

$x = \pm$  \_\_\_\_\_

The solutions are \_\_\_\_\_ and \_\_\_\_\_.

2.  $x^2 = 100$

$x = \pm\sqrt{\quad}$

$x = \pm$  \_\_\_\_\_

The solutions are \_\_\_\_\_ and \_\_\_\_\_.

3.  $x^2 = 225$

$x = \pm\sqrt{\quad}$

$x =$  \_\_\_\_\_

4.  $441 = x^2$

$\pm\sqrt{\quad} = x$

\_\_\_\_\_ = x

5.  $x^2 = -400$

\_\_\_\_\_

6.  $3x^2 = 108$

\_\_\_\_\_

7.  $100 = 4x^2$

\_\_\_\_\_

8.  $x^2 + 7 = 71$

\_\_\_\_\_

9.  $49x^2 - 64 = 0$

\_\_\_\_\_

10.  $-2x^2 = -162$

\_\_\_\_\_

11.  $9x^2 + 100 = 0$

\_\_\_\_\_

12.  $0 = 81x^2 - 121$

\_\_\_\_\_

13.  $100x^2 = 25$

\_\_\_\_\_

14.  $100x^2 = 121$

\_\_\_\_\_

Solve. Round to the nearest hundredth.

15.  $8x^2 = 56$

\_\_\_\_\_

16.  $5 - x^2 = 20$

\_\_\_\_\_

17.  $x^2 + 35 = 105$

\_\_\_\_\_

18. The height of a skydiver jumping out of an airplane is given by  $h = -16t^2 + 3200$ . How long will it take the skydiver to reach the ground? Round to the nearest tenth of a second.

\_\_\_\_\_

19. The height of a triangle is twice the length of its base. The area of the triangle is  $50 \text{ m}^2$ . Find the height and base to the nearest tenth of a meter.

\_\_\_\_\_

20. The height of an acorn falling out of a tree is given by  $h = -16t^2 + b$ . If an acorn takes 1 second to fall to the ground. What is the value of  $b$ ?

\_\_\_\_\_

**LESSON**  
**9-8****Practice B**  
**Completing the Square**

Complete the square to form a perfect square trinomial.

1.  $x^2 + 4x + \square$

2.  $x^2 - 16x + \square$

3.  $x^2 + 7x + \square$

Solve each equation by completing the square.

4.  $x^2 + 6x = -8$

5.  $x^2 + 4x = 12$

6.  $x^2 - 2x = 15$

7.  $x^2 - 8x + 13 = 0$

8.  $x^2 + 6x + 34 = 0$

9.  $x^2 - 2x - 35 = 0$

10.  $2x^2 + 16x + 42 = 0$

11.  $4x^2 - 7x - 2 = 0$

12.  $2x^2 + 9x + 4 = 0$

13. A rectangular pool has an area of  $880 \text{ ft}^2$ . The length is 10 feet longer than the width. Find the dimensions of the pool. Solve by completing the square. Round answers to the nearest tenth of a foot.

14. A small painting has an area of  $400 \text{ cm}^2$ . The length is 4 more than 2 times the width. Find the dimensions of the painting. Solve by completing the square. Round answers to the nearest tenth of a centimeter.

## LESSON

## 9-9

**Practice B*****The Quadratic Formula and the Discriminant***

Solve using the quadratic formula.

1.  $x^2 + x = 12$

2.  $4x^2 - 17x - 15 = 0$

\_\_\_\_\_

\_\_\_\_\_

3.  $2x^2 - 5x = 3$

4.  $3x^2 + 14x - 5 = 0$

\_\_\_\_\_

\_\_\_\_\_

Find the number of real solutions of each equation using the discriminant.

5.  $x^2 + 25 = 0$

6.  $x^2 - 11x + 28 = 0$

7.  $x^2 + 8x + 16 = 0$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Solve using any method.

8.  $x^2 + 8x + 15 = 0$

9.  $x^2 - 49 = 0$

\_\_\_\_\_

\_\_\_\_\_

10.  $6x^2 + x - 1 = 0$

11.  $x^2 + 8x - 20 = 0$

\_\_\_\_\_

\_\_\_\_\_

12. In the past, professional baseball was played at the Astrodome in Houston, Texas. The Astrodome has a maximum height of 63.4 m. The height of a baseball  $t$  seconds after it is hit straight up in the air with a velocity of 45 ft/s is given by  $h = -9.8t^2 + 45t + 1$ . Will a baseball hit straight up with this velocity hit the roof of the Astrodome? Use the discriminant to explain your answer.

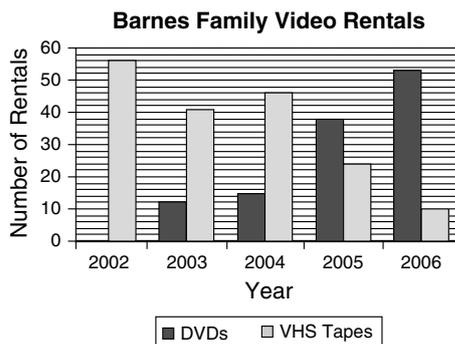
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**LESSON**  
**10-1** **Practice B**  
**Organizing and Describing Data**

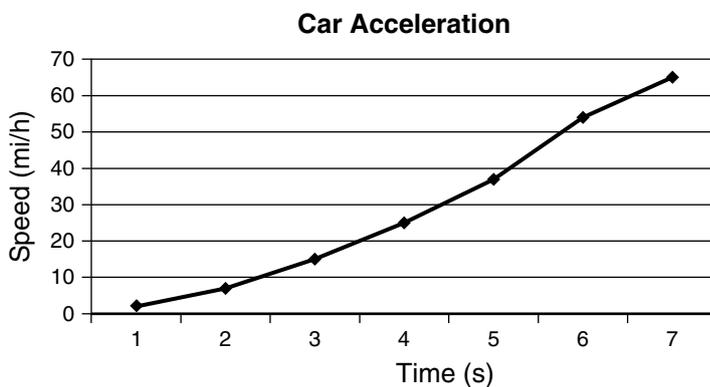
Look at the double bar graph.

- Which was the first year that the Barnes rented more DVDs than VHS tapes?  
\_\_\_\_\_
- About how many videos did the Barnes family rent in all in 2003?  
\_\_\_\_\_



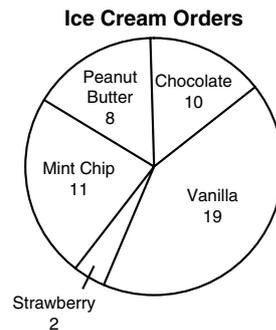
Look at the line graph.

- During which time interval did the car's speed increase the least?  
\_\_\_\_\_
- Describe how the speed changed over time.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



Look at the circle graph.

- There were 5 times the number of orders for \_\_\_\_\_ as there were for strawberry.
- What percent of the orders for ice cream were for mint chip or vanilla? \_\_\_\_\_
- The table shows the number of customers who pumped 4 types of fuel at a gas station in a given time period. Use the given data to make a graph. Explain why you chose that type of graph.



87 Octane	89 Octane	93 Octane	Diesel
12	1	5	2

**LESSON**  
**10-2**

**Practice B**  
**Frequency and Histograms**

1. Heights of two groups of plants after two weeks are given at right.
- a. Which group had the tallest plant? What was its height?
- \_\_\_\_\_

Group A	Group B
	1 2
	2 3 4
9 7 3 3	3 5 5 8
8 1	4 1
0	5

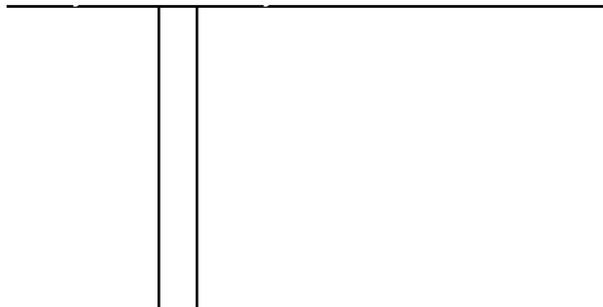
Key: |2|3 means 2.3  
1|4 means 1.4

- b. One group had twice as much sunlight as the other. Which group do you think it was? Explain.
- \_\_\_\_\_

2. The receiving yards completed by two wide receivers on different professional football teams in each of the 16 regular season games is given. Use the data to make a back-to-back stem-and-leaf plot.

Player A: 32, 17, 94, 79, 68, 73, 63, 84, 72, 73, 45, 69, 94, 89, 84, 34

Player B: 79, 12, 97, 73, 54, 82, 21, 32, 28, 67, 74, 88, 41, 38, 78, 67

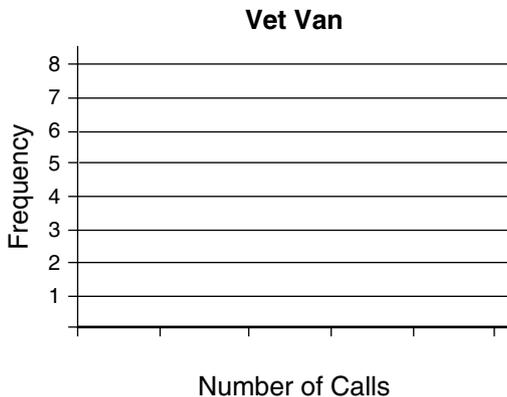


3. The number of calls per day received by a traveling Vet Van service for three weeks is given below. Use the data to make a frequency table with intervals.

Number of Calls						
18	22	13	15	16	21	22
26	17	14	12	13	18	14
16	22	23	20	21	18	22

Vet Van	
Number of Calls	Frequency

4. Use the frequency table in Exercise 3 to make a histogram.



5. Complete the "third column" for the table in Exercise 3 to make it a cumulative frequency table.

Cumulative Frequency

**LESSON**  
**10-3**

**Practice B**  
**Data Distributions**

Find the mean, median, mode, and range of each set of data.

1. 12, 15, 19, 18, 21

2. 12, 5, 16, 21, 82, 11, 7, 5, 30

\_\_\_\_\_

\_\_\_\_\_

3. 13, 15, 12, 18, 18, 12, 13, 16, 18, 18, 14, 13

4. 135, 70, 155, 140, 135, 140, 145, 80

\_\_\_\_\_

\_\_\_\_\_

5. Henri's times for running one lap around a track, in seconds, are 59, 63, 62, 63, 77, and 60. Use the mean, median, and mode to answer the following questions.

mean = 64

median = 62.5

mode = 63

a. Which value gives Henri's average lap time? \_\_\_\_\_

b. Which values describes the lap time recorded most often? \_\_\_\_\_

c. Which value best describes Henri's lap times? Explain.

\_\_\_\_\_

\_\_\_\_\_

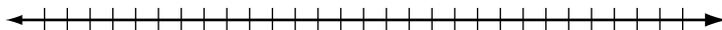
6. Find the interquartile range of the data set:

13, 19, 25, 17, 54, 32, 19, 26, 14, 44, and 50. \_\_\_\_\_

7. The number of points scored per game by a basketball player is given.

Use the data to make a box-and-whisker plot.

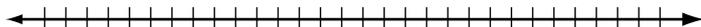
21, 18, 20, 16, 9, 16, 12, 22, 15, 17, 11



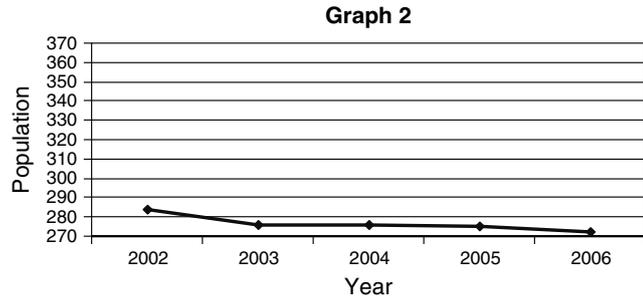
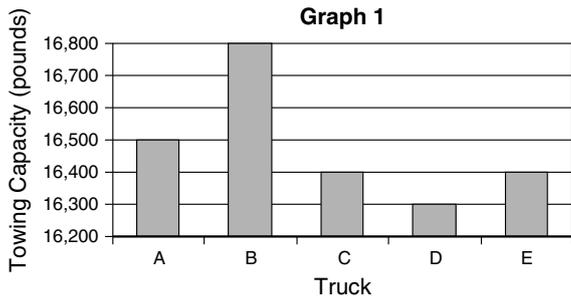
8. The ages of the first fourteen people to enter a museum are

10, 38, 44, 12, 12, 18, 24, 30, 13, 16, 50, 19, 64, and 44.

Use the data to make a box-and-whisker plot.



**LESSON**  
**10-4** **Practice B**  
**Misleading Graphs and Statistics**



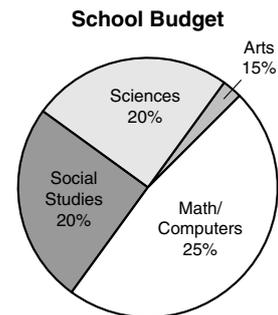
**Graph 1 shows the maximum towing capacity of five full-size pickup trucks.**

1. Explain why the graph is misleading. \_\_\_\_\_  
\_\_\_\_\_
2. What might someone believe because of the graph? \_\_\_\_\_  
\_\_\_\_\_
3. The manufacturer of which truck would be most upset with this graph? \_\_\_\_\_

**Graph 2 shows the change in population of a certain animal species in a wooded area.**

4. Explain why the graph is misleading. \_\_\_\_\_  
\_\_\_\_\_
5. What might someone believe because of the graph? \_\_\_\_\_  
\_\_\_\_\_
6. Who might want to use this graph? \_\_\_\_\_

**The circle graph shows how a school distributed money.**



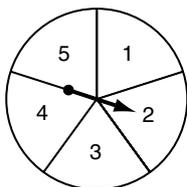
7. Explain why the graph is misleading. \_\_\_\_\_  
\_\_\_\_\_
8. What might someone believe because of the graph? \_\_\_\_\_  
\_\_\_\_\_
9. Who might want to use this graph? \_\_\_\_\_
10. Sue surveyed people at a baseball stadium about their leisure activities. Explain why her statement is misleading: "85% of this town prefers sports over music."  
\_\_\_\_\_

**LESSON**  
**10-5**

**Practice B**  
**Experimental Probability**

Identify the sample space and the outcome shown for each experiment.

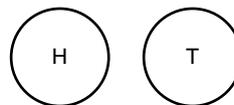
1. spinning a spinner



\_\_\_\_\_

\_\_\_\_\_

2. tossing two coins



\_\_\_\_\_

\_\_\_\_\_

Write *impossible, unlikely, as likely as not, likely, or certain* to describe each event.

3. The mail was delivered before noon on 4 of the last 5 days. The mail will be delivered before noon today.

\_\_\_\_\_

4. Sean rolls a number cube and gets an even number.

\_\_\_\_\_

5. The pages of a book are numbered 1 – 350. Amelia begins reading on page 400.

\_\_\_\_\_

An experiment consists of rolling a standard number cube. Use the results in the table to find the experimental probability of each event.

6. rolling a 1

\_\_\_\_\_

7. rolling a 5

\_\_\_\_\_

8. not rolling a 3

\_\_\_\_\_

9. not rolling a number less than 5

\_\_\_\_\_

Outcome	Frequency
1	6
2	7
3	4
4	10
5	8
6	5

10. A tire manufacturer checks 80 tires and finds 6 of them to be defective.

a. What is the experimental probability that a tire chosen at random will be defective?

\_\_\_\_\_

b. The factory makes 200 tires. Predict the number of tires that are likely to be defective.

\_\_\_\_\_

11. A safety commission tested 1500 electric scooters and found that 15 of them had defective handles.

a. What is the experimental probability that a scooter will have a defective handle?

\_\_\_\_\_

b. The factory makes 40,000 scooters. Predict the number of scooters that are likely to have defective handles.

\_\_\_\_\_

**LESSON**  
**10-6** **Practice B**  
**Theoretical Probability**

Find the theoretical probability of each outcome.

1. rolling a number less than 4 on a standard number cube \_\_\_\_\_
2. randomly choosing a day of the week and it is a weekend \_\_\_\_\_
3. spinning red on a spinner with equal sections of red, blue, and green \_\_\_\_\_
4. randomly choosing the letter N from the letters in NUMBER \_\_\_\_\_
5. The probability it will snow is 60%. What is the probability it will not snow? \_\_\_\_\_
6. The probability of tossing two coins and having them land heads up is  $\frac{1}{4}$ . What is the probability the coins will not land heads up? \_\_\_\_\_
7. A spinner has red, green, blue, and yellow. The probability of spinning a red is 0.4, the probability of spinning a blue is 0.05 and the probability of spinning a yellow is 0.25. What is the probability of spinning a green? \_\_\_\_\_
8. Miguel entered a contest offering prizes to the top 3 finishers. The probability of winning 1st is 12%, the probability of winning 2nd is 18% and probability of winning 3rd is 20%. What is the probability that Miguel will not win any prize? \_\_\_\_\_
9. The odds of winning a contest are 1:50. What is the probability of winning the contest? \_\_\_\_\_
10. The odds against a spinner landing on yellow are 3:1. What is the probability the spinner will not land on yellow? \_\_\_\_\_
11. The probability of a thunderstorm is 80%. What are the odds that there will be a thunderstorm? \_\_\_\_\_
12. The odds of selecting a red card from a box of cards are 2:5. What is the probability of not selecting a red card from a box? \_\_\_\_\_

The table shows how many of each letter are in a bag. Use the table for 13–16. Find the following.

- |  |                                      |
|--|--------------------------------------|
| 13. $P(A)$<br>_____<br>_____             | 14. $P(B)$<br>_____<br>_____         |
| 15. odds in favor of C<br>_____<br>_____ | 16. odds against E<br>_____<br>_____ |

Letter	How Many in Bag
A	5
B	4
C	6
D	2
E	8

**LESSON**  
**10-7** **Practice B**  
**Independent and Dependent Events**

Tell whether each set of events is independent or dependent.  
Explain your answer.

1. You roll a die and flip a coin. \_\_\_\_\_  
\_\_\_\_\_
2. You select one marble, do not replace it, then select another marble. \_\_\_\_\_  
\_\_\_\_\_
3. A number cube is rolled three times. What is the probability of rolling a 2 each time? \_\_\_\_\_
4. The numbers 1 – 40 are written on pieces of paper and put in a box. Two pieces of paper are randomly selected. What is the probability both numbers will be multiples of 4? \_\_\_\_\_
5. A coin is tossed 4 times. What is the probability of getting 4 tails? \_\_\_\_\_
6. **A bag contains 2 yellow, 12 red, and 6 green marbles.**
  - a. What is the probability of selecting a red marble, replacing it, then selecting another red marble? \_\_\_\_\_
  - b. What is the probability of selecting a red marble, not replacing it, then selecting another red marble? \_\_\_\_\_
  - c. What is the probability of selecting 1 yellow marble, not replacing it, then selecting a green marble? \_\_\_\_\_
7. **There are 7 girls and 3 boys in a class. Two students are to be randomly chosen for a special project.**
  - a. What is the probability both students will be girls? \_\_\_\_\_
  - b. What is the probability both students will be boys? \_\_\_\_\_
  - c. What is the probability of selecting a boy and a girl? \_\_\_\_\_

**A music class consists of 9th and 10th graders as shown in the table. Two students will be selected at the same time.**

Music Class		
	9th	10th
male	9	8
female	12	11

8. What is the probability both students are male? \_\_\_\_\_
9. What is the probability both students are 9th graders? \_\_\_\_\_
10. What is the probability one student is female and the second student is male? \_\_\_\_\_

**LESSON**  
**10-8** **Practice B**  
**Combinations and Permutations**

1. A code consists of 3 letters and then 3 digits. Any of the letters and numbers can be repeated. How many different codes are there?  
\_\_\_\_\_

2. A restaurant is having a breakfast special. The choices are shown in the table. How many different breakfasts with one of each item are possible?  
\_\_\_\_\_

Eggs	Meat	Bread	Juice
fried	bacon	biscuits	apple
scrambled	sausage	toast	orange
	ham		

3. A movie on DVD comes with different viewing options as shown in the table. How many different ways can the movie be watched?  
\_\_\_\_\_

Audio	Commentary	Language
on	on	English
off	off	Spanish
		French

**Write C for combinations or P for permutations. Then answer the question.**

4. A coach must pick 5 players out of 30 to go on a trip. How many ways can the 5 players be chosen?  
\_\_\_\_\_

5. Jenn has 5 types of flowers in her garden. How many ways can she make a bouquet consisting of 2 types of flowers?  
\_\_\_\_\_

6. How many different ways can the letters in MUSIC be arranged?  
\_\_\_\_\_

7. A grocery store carries 15 different types of cereals. Only 4 of the cereals can be displayed on the middle shelf. How many different ways can the 4 cereals be displayed?  
\_\_\_\_\_

**Answer each question.**

8. A science fair awards prizes to the first, second and third place winners. There are 48 people entered in the science fair. How many ways can the winners be selected?  
\_\_\_\_\_

9. A 3-digit computer password consists only of odd numbers that cannot be repeated. How many different 3-digit passwords are possible?  
\_\_\_\_\_

10. In a lottery, 6 different numbers are selected from a set of 50 numbers. A winner can have the numbers in any order. How many sets of winning numbers are there?  
\_\_\_\_\_

11. A band competition awards prizes to the top 3 schools. If 12 schools are entered, how many ways can 3 schools be chosen?  
\_\_\_\_\_

**LESSON**  
**11-1**

**Practice B**  
**Geometric Sequences**

Find the next three terms in each geometric sequence.

1.  $-5, -10, -20, -40, \dots$

2.  $7, 56, 448, 3584, \dots$

\_\_\_\_\_

\_\_\_\_\_

3.  $-10, 40, -160, 640, \dots$

4.  $40, 10, \frac{5}{2}, \frac{5}{8}, \dots$

\_\_\_\_\_

\_\_\_\_\_

5. The first term of a geometric sequence is 6 and the common ratio is  $-8$ . Find the 7th term.

\_\_\_\_\_

6. The first term of a geometric sequence is  $-3$  and the common ratio is  $\frac{1}{2}$ . Find the 6th term.

\_\_\_\_\_

7. The first term of a geometric sequence is  $-0.25$  and the common ratio is  $-3$ . Find the 10th term.

\_\_\_\_\_

8. What is the 12th term of the geometric sequence  $-4, -12, -36, \dots$ ?

\_\_\_\_\_

9. What is the 10th term of the geometric sequence  $2, -6, 18, \dots$ ?

\_\_\_\_\_

10. What is the 6th term of the geometric sequence  $50, 10, 2, \dots$ ?

\_\_\_\_\_

11. A shoe store is discounting shoes each month. A pair of shoes cost \$80. The table shows the discount prices for several months. Find the cost of the shoes after 8 months. Round your answer to the nearest cent.

Month	Price
1	\$80.00
2	\$72.00
3	\$64.80

\_\_\_\_\_

**LESSON**  
**11-2** **Practice B**  
**Exponential Functions**

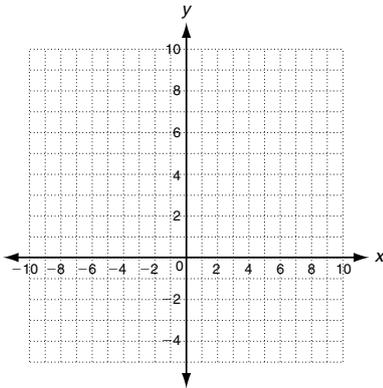
1. If a basketball is bounced from a height of 15 feet, the function  $f(x) = 15(0.75)^x$  gives the height of the ball in feet of each bounce, where  $x$  is the bounce number. What will be the height of the 5th bounce? Round to the nearest tenth of a foot.
- \_\_\_\_\_

**Tell whether each set of ordered pairs satisfies an exponential function. Explain your answer.**

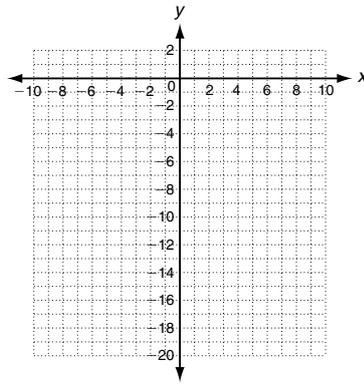
2.  $\{(2, 4), (4, 8), (6, 16), (8, 32)\}$  \_\_\_\_\_  
\_\_\_\_\_
3.  $\{(-2, 5), (-1, 10), (0, 15), (1, 20)\}$  \_\_\_\_\_  
\_\_\_\_\_
4.  $\{(1, 750), (2, 150), (3, 30), (4, 6)\}$  \_\_\_\_\_  
\_\_\_\_\_
5.  $\left\{\left(-5, \frac{1}{3}\right), (0, 1), (5, 3), (10, 9)\right\}$  \_\_\_\_\_  
\_\_\_\_\_

**Graph each exponential function.**

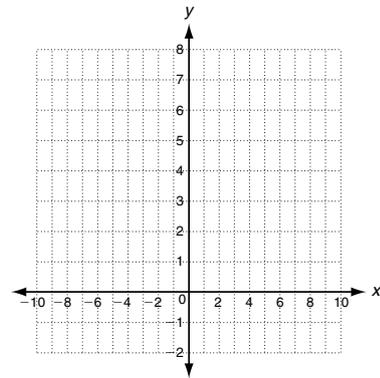
6.  $y = 5(2)^x$



7.  $y = -2(3)^x$



8.  $y = 3\left(\frac{1}{2}\right)^x$



**In the year 2000, the population of Virginia was about 7,400,000. Between the years 2000 and 2004, the population in Virginia grew at a rate of 5.4%. At this growth rate, the function  $f(x) = 7,400,000(1.054)^x$  gives the population  $x$  years after 2000.**

9. In what year will the population reach 15,000,000? \_\_\_\_\_
10. In what year will the population reach 20,000,000? \_\_\_\_\_

**LESSON**  
**11-3** **Practice B**  
**Exponential Growth and Decay**

**Write an exponential growth function to model each situation. Then find the value of the function after the given amount of time.**

1. Annual sales for a fast food restaurant are \$650,000 and are increasing at a rate of 4% per year; 5 years  
 \_\_\_\_\_  
 \_\_\_\_\_
2. The population of a school is 800 students and is increasing at a rate of 2% per year; 6 years  
 \_\_\_\_\_  
 \_\_\_\_\_
3. During a certain period of time, about 70 northern sea otters had an annual growth rate of 18%; 4 years  
 \_\_\_\_\_  
 \_\_\_\_\_

**Write a compound interest function to model each situation. Then find the balance after the given number of years.**

4. \$50,000 invested at a rate of 3% compounded monthly; 6 years  
 \_\_\_\_\_  
 \_\_\_\_\_
5. \$43,000 invested at a rate of 5% compounded annually; 3 years  
 \_\_\_\_\_  
 \_\_\_\_\_
6. \$65,000 invested at a rate of 6% compounded quarterly; 12 years  
 \_\_\_\_\_  
 \_\_\_\_\_

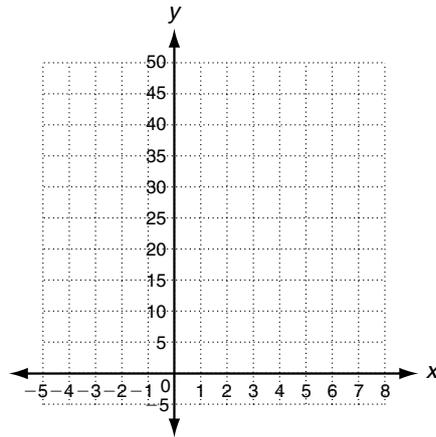
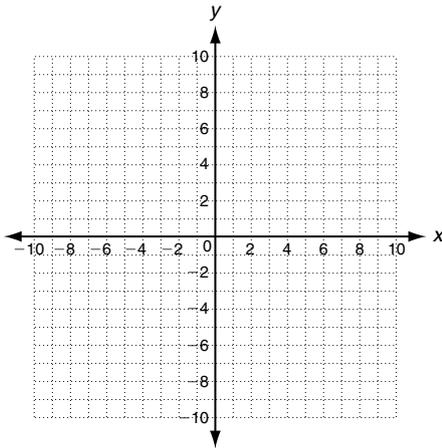
**Write an exponential decay function to model each situation. Then find the value of the function after the given amount of time.**

7. The population of a town is 2500 and is decreasing at a rate of 3% per year; 5 years  
 \_\_\_\_\_  
 \_\_\_\_\_
8. The value of a company's equipment is \$25,000 and decreases at a rate of 15% per year; 8 years  
 \_\_\_\_\_  
 \_\_\_\_\_
9. The half-life of Iodine-131 is approximately 8 days. Find the amount of Iodine-131 left from a 35 gram sample after 32 days. \_\_\_\_\_

**LESSON** **11-4** **Practice B**  
**Linear, Quadratic, and Exponential Models**

Graph each data set. Which kind of model best describes the data?

1.  $\{(-2, 0), (-1, -3), (0, -4), (1, -3), (2, 0)\}$     2.  $\{(0, 3), (1, 6), (2, 12), (3, 24), (4, 48)\}$



Look for a pattern in each data set to determine which kind of model best describes the data.

3.  $\{(-5, 9), (-4, 0), (-3, -7), (-2, -12)\}$  \_\_\_\_\_  
 4.  $\{(-2, 9), (-1, 13), (0, 17), (1, 21)\}$  \_\_\_\_\_  
 5.  $\{(1, 4), (2, 6), (3, 9), (4, 13.5)\}$  \_\_\_\_\_  
 6.  $\{(0, 4), (2, 12), (4, 36), (6, 76)\}$  \_\_\_\_\_  
 7.  $\{(1, 17), (3, 8\frac{1}{2}), (5, 4\frac{1}{4}), (7, 2\frac{1}{8})\}$  \_\_\_\_\_

8. Use the data in the table to describe how the restaurant's sales are changing. Then write a function that models the data. Use your function to predict the amount of sales after 8 years.

Restaurant				
Year	0	1	2	3
Sales (\$)	20,000	19,000	18,050	17,147.50

9. Use the data in the table to describe how the clothing store's sales are changing. Then write a function that models the data. Use your function to predict the amount of sales after 10 years.

Clothing Store				
Year	0	1	2	3
Sales (\$)	15,000	15,750	16,500	17,250

**LESSON**  
**11-5** **Practice B**  
**Square-Root Functions**

- An apartment manager needs to order wallpaper border for the remodeled bathrooms. The function  $y = 640\sqrt{x}$  gives the amount of border needed, in feet, if  $x$  is the square footage of each bathroom. Find the amount of border needed if each bathroom is  $100 \text{ ft}^2$ . \_\_\_\_\_
- The current  $I$ , in amps, flowing through a household appliance is given by  $I = \sqrt{\frac{P}{R}}$ , where  $P$  is the power required in watts and  $R$  is the resistance in ohms. What is the current in an electric skillet when the power required is 1500 watts and the resistance is 75 ohms? Round your answer to the nearest tenth. \_\_\_\_\_

**Find the domain of each square-root function.**

- |   |                                    |                                   |
|---|------------------------------------|-----------------------------------|
| 3. $y = \sqrt{x + 6}$<br>$x \geq$ _____   | 4. $y = \sqrt{-3x}$<br>_____       | 5. $y = \sqrt{2x + 8}$<br>_____   |
| 6. $y = \sqrt{\frac{2}{3}x - 6}$<br>_____ | 7. $y = -2\sqrt{10 - 5x}$<br>_____ | 8. $y = \sqrt{7(x - 3)}$<br>_____ |

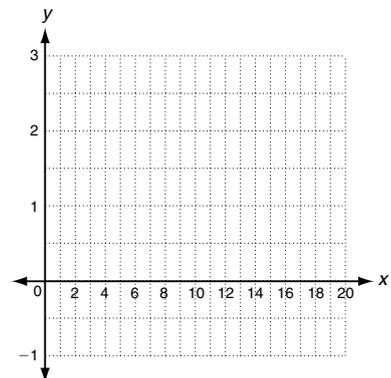
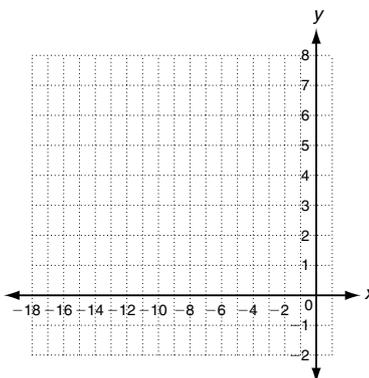
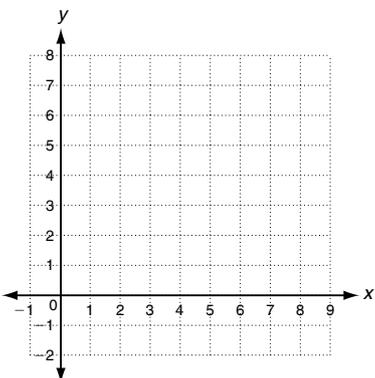
**Complete each function table. Then graph each square-root function.**

- |                       |                            |                                      |
|-----------------------|----------------------------|--------------------------------------|
| 9. $f(x) = \sqrt{4x}$ | 10. $f(x) = \sqrt{-x} + 3$ | 11. $f(x) = \frac{1}{2}\sqrt{x - 2}$ |
|-----------------------|----------------------------|--------------------------------------|

$x$	$f(x)$
0	
$\frac{1}{4}$	
1	
4	
9	

$x$	$f(x)$
0	
-1	
-4	
-9	
-16	

$x$	$f(x)$



## LESSON

**Practice B****11-6****Radical Expressions**

Simplify each expression.

1.  $\sqrt{225} =$  \_\_\_\_\_

2.  $\sqrt{\frac{75}{3}} = \sqrt{\square} =$  \_\_\_\_\_

3.  $\sqrt{7^2 + 24^2} =$  \_\_\_\_\_

4.  $\sqrt{(x + 8)^2} = |\underline{\hspace{2cm}}|$

5.  $\sqrt{\frac{4}{100}} =$  \_\_\_\_\_

6.  $\sqrt{x^2 + 8x + 16} =$  \_\_\_\_\_

Simplify. All variables represent nonnegative numbers.

7.  $\sqrt{32}$

8.  $\sqrt{28}$

9.  $\sqrt{x^4 y^3}$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

10.  $\sqrt{147}$

11.  $\sqrt{45}$

12.  $\sqrt{36x^4 y^5}$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

13.  $\sqrt{\frac{7}{25}}$

14.  $\sqrt{\frac{3b^2}{27b^4}}$

15.  $\sqrt{\frac{m^3}{121n^4}}$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

16.  $\sqrt{\frac{10b^4}{2b^3}}$

17.  $\sqrt{\frac{9y^6}{36y^2}}$

18.  $\sqrt{\frac{40m^3}{10n^4}}$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

19.  $\sqrt{\frac{128}{25}}$

20.  $\sqrt{\frac{4}{81x^8}}$

21.  $\sqrt{\frac{250q^{10}}{5q^4}}$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

22. Two hikers leave a ranger station at noon. Tom heads due south at 5 mi/h and Kyle heads due east at 3 mi/h. How far apart are the hikers at 4 PM? Give your answer as a radical expression in simplest form. Then estimate the distance to the nearest tenth of a mile.

\_\_\_\_\_

**LESSON**  
**11-7**

**Practice B**

**Adding and Subtracting Radical Expressions**

Add or subtract.

1.  $9\sqrt{7} + 4\sqrt{7} = \underline{\hspace{2cm}} \sqrt{7}$

2.  $-10\sqrt{5} + 2\sqrt{5} = \underline{\hspace{2cm}} \sqrt{5}$

3.  $4\sqrt{y} + 6\sqrt{y} = \underline{\hspace{2cm}}$

4.  $-2\sqrt{3b} + 10\sqrt{3b} = \underline{\hspace{2cm}}$

5.  $6\sqrt{15} - \sqrt{15} + \sqrt{15} = \underline{\hspace{2cm}}$

6.  $5\sqrt{2} - 3\sqrt{2x} - 4\sqrt{2} = \underline{\hspace{2cm}}$

Simplify each expression.

7.  $\sqrt{108} + \sqrt{75}$   
\_\_\_\_\_

8.  $\sqrt{63} + \sqrt{175} + \sqrt{112}$   
\_\_\_\_\_

9.  $\sqrt{28x} + \sqrt{63x}$   
\_\_\_\_\_

10.  $\sqrt{45} + \sqrt{180}$   
\_\_\_\_\_

11.  $\sqrt{52} - \sqrt{1300}$   
\_\_\_\_\_

12.  $5\sqrt{98} - 3\sqrt{32}$   
\_\_\_\_\_

13.  $\sqrt{32} + \sqrt{128}$   
\_\_\_\_\_

14.  $\sqrt{147} + 6\sqrt{3}$   
\_\_\_\_\_

15.  $\sqrt{168} + \sqrt{42}$   
\_\_\_\_\_

16.  $5\sqrt{17} + 17\sqrt{5}$   
\_\_\_\_\_

17.  $6\sqrt{3} + \sqrt{300}$   
\_\_\_\_\_

18.  $-2\sqrt{3b} + \sqrt{27b}$   
\_\_\_\_\_

19.  $4\sqrt{2m} + 6\sqrt{3m} - 4\sqrt{2m}$   
\_\_\_\_\_

20.  $\sqrt{50m} + \sqrt{72m}$   
\_\_\_\_\_

21.  $\sqrt{16z} + 2\sqrt{8z} - 3\sqrt{z}$   
\_\_\_\_\_

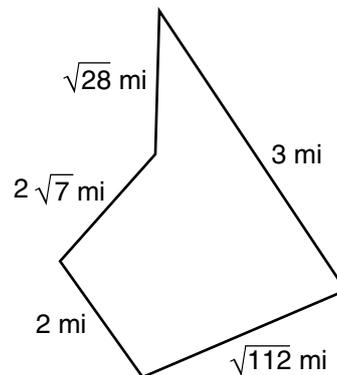
22.  $\sqrt{216t} + \sqrt{96t}$   
\_\_\_\_\_

23.  $4\sqrt{52x} + \sqrt{117x} - 2\sqrt{13}$   
\_\_\_\_\_

24.  $3\sqrt{96k} + 2\sqrt{180}$   
\_\_\_\_\_

25. Write the numbers  $3\sqrt{8}$ ,  $4\sqrt{2}$  and  $\sqrt{50}$  in order from least to greatest.  
\_\_\_\_\_

26. The map at right shows the path traveled by a delivery person on his afternoon route. Write the total distance traveled as a simplified radical expression.  
\_\_\_\_\_



## LESSON

**Practice B****11-8*****Multiplying and Dividing Radical Expressions*****Multiply. Write each product in simplest form.**

1.  $\sqrt{15} \cdot \sqrt{6}$

$\sqrt{15 \cdot 6}$   
\_\_\_\_\_

2.  $(3\sqrt{6})^2$

$3\sqrt{6} \cdot 3\sqrt{6}$   
\_\_\_\_\_

3.  $4\sqrt{7x} \cdot \sqrt{20x}$

$4 \cdot \sqrt{(7x)(20x)}$   
\_\_\_\_\_

4.  $\sqrt{12} \cdot \sqrt{5}$   
\_\_\_\_\_

5.  $(2\sqrt{7})^2$   
\_\_\_\_\_

6.  $-2\sqrt{5b} \cdot \sqrt{10b}$   
\_\_\_\_\_

7.  $3\sqrt{10y} \sqrt{6y}$   
\_\_\_\_\_

8.  $\sqrt{8}(\sqrt{12} - \sqrt{2})$   
\_\_\_\_\_

9.  $\sqrt{2x}(\sqrt{5} + \sqrt{2x})$   
\_\_\_\_\_

10.  $\sqrt{2}(\sqrt{7} - 5)$   
\_\_\_\_\_

11.  $\sqrt{10}(\sqrt{5m} - \sqrt{4})$   
\_\_\_\_\_

12.  $(4 + \sqrt{3})(2 - \sqrt{3})$   
\_\_\_\_\_

13.  $\sqrt{3}(\sqrt{8} - 6)$   
\_\_\_\_\_

14.  $\sqrt{5}(\sqrt{2} + \sqrt{8})$   
\_\_\_\_\_

15.  $(5 + \sqrt{2})(6 - \sqrt{2})$   
\_\_\_\_\_

16.  $\sqrt{5}(\sqrt{2} - \sqrt{6})$   
\_\_\_\_\_

17.  $(3 - \sqrt{2})(5 + \sqrt{2})$   
\_\_\_\_\_

18.  $(7 + \sqrt{3})(7 - \sqrt{3})$   
\_\_\_\_\_

**Simplify each quotient.**

19.  $\frac{\sqrt{2}}{\sqrt{6}}$   
\_\_\_\_\_

20.  $\frac{\sqrt{10}}{\sqrt{11}}$   
\_\_\_\_\_

21.  $\frac{\sqrt{13}}{\sqrt{50t}}$   
\_\_\_\_\_

22.  $\frac{\sqrt{7}}{\sqrt{15}}$   
\_\_\_\_\_

23.  $\frac{\sqrt{2}}{\sqrt{17}}$   
\_\_\_\_\_

24.  $\frac{\sqrt{32}}{\sqrt{48z}}$   
\_\_\_\_\_

25.  $\frac{\sqrt{3}}{\sqrt{3a}}$   
\_\_\_\_\_

26.  $\frac{\sqrt{8x}}{\sqrt{5}}$   
\_\_\_\_\_

27.  $-\frac{\sqrt{75k}}{10\sqrt{2k}}$   
\_\_\_\_\_

## LESSON

**Practice B****11-9 Solving Radical Equations**

Solve each equation. Check your answer.

1.  $\sqrt{x} = 11$

$(\sqrt{x})^2 = (11)^2$

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

2.  $\frac{\sqrt{x}}{3} = 5$

$\sqrt{x} = 15$

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

3.  $\sqrt{3x} + 5 = 11$

$\sqrt{3x} = \underline{\hspace{2cm}}$

$3x = \underline{\hspace{2cm}}$

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

4.  $2\sqrt{x} = 16$

5.  $\frac{\sqrt{4x}}{2} = 4$

6.  $\frac{3\sqrt{20x+4}}{4} = 6$

7.  $\sqrt{x+5} = 9$

8.  $\frac{\sqrt{x}}{4} = 1$

9.  $\frac{3\sqrt{2x}}{4} = 12$

10.  $\frac{\sqrt{2x}}{4} = 2$

11.  $\frac{\sqrt{x+5}}{3} = 4$

12.  $3\sqrt{6-x} = 6$

13.  $\sqrt{10-x} = \sqrt{x-2}$

14.  $\sqrt{x+2} = \sqrt{2x-1}$

15.  $\sqrt{2x+10} - \sqrt{x+13} = 0$

16.  $\sqrt{-x} = \sqrt{x+128}$

17.  $\sqrt{4+x} = 5\sqrt{x-20}$

18.  $4 + x = \sqrt{x+4}$

19.  $-3\sqrt{x} = 8$

20.  $x = \sqrt{2x+15}$

21. According to Heron's formula, the area of a triangle is given by

$A = \sqrt{s(s-a)(s-b)(s-c)}$ , where  $s$  is equal to one half its perimeter, and  $a$ ,  $b$ , and  $c$  are the lengths of its sides. If a triangle has area  $20 \text{ m}^2$ ,  $s = 10 \text{ m}$ ,  $a = 5 \text{ m}$  and  $b = 2 \text{ m}$ , what is  $c$ ? \_\_\_\_\_

**LESSON**  
**12-1** **Practice B**  
**Inverse Variation**

Tell whether each relationship is an inverse relation. Explain.

1. 

$x$	$y$
2	12
3	8
4	6

2. 

$x$	$y$
1	4
2	8
3	12

\_\_\_\_\_

\_\_\_\_\_

3.  $x = \frac{y}{5}$

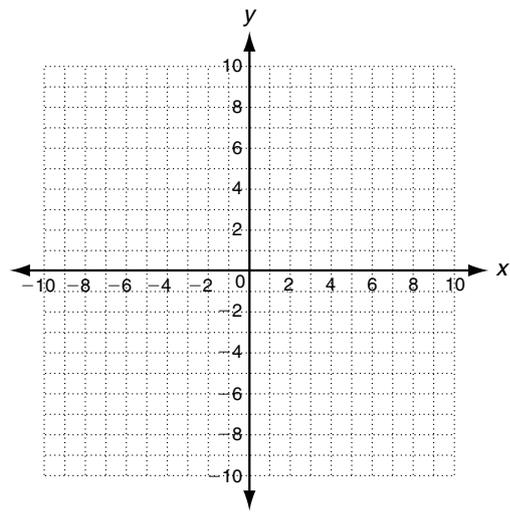
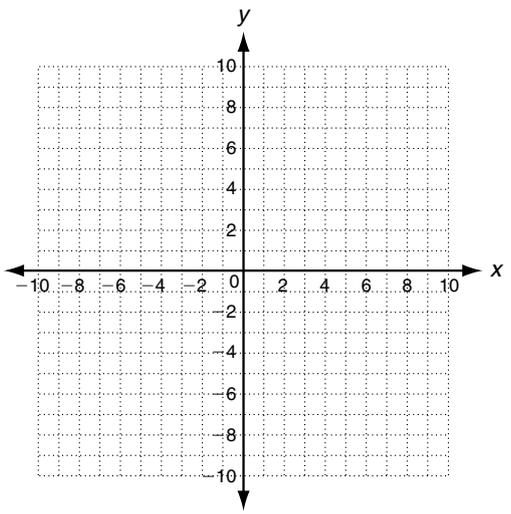
4.  $xy = 8$

\_\_\_\_\_

\_\_\_\_\_

5. Write and graph the inverse variation in which  $y = 3$  when  $x = 2$ .

6. Write and graph the inverse variation in which  $y = 1$  when  $x = -3$ .



\_\_\_\_\_

\_\_\_\_\_

7. Let  $x_1 = 4$ ,  $y_1 = 12$ , and  $x_2 = 3$ . Let  $y$  vary inversely as  $x$ . Find  $y_2$ . \_\_\_\_\_

8. Let  $x_1 = 3$ ,  $y_1 = 10$ , and  $y_2 = 15$ . Let  $y$  vary inversely as  $x$ . Find  $x_2$ . \_\_\_\_\_

9. While traveling in a car, the speed of the car is inversely proportional to the time it takes to travel a certain distance. At 25 mi/h, it takes 15 minutes to travel to work. How many minutes would it take traveling 30 mi/h? \_\_\_\_\_

10. The amount of pizza that Kirby can buy varies inversely as the price of the pizza increases. Kirby can afford to buy 3 pizzas that cost \$15.00 each. How many pizzas that cost \$9.00 each can Kirby buy? \_\_\_\_\_

**LESSON**  
**12-2** **Practice B**  
**Rational Functions**

Identify the excluded value for each rational function.

1.  $y = \frac{-6}{x}$

\_\_\_\_\_

2.  $y = \frac{8}{x+3}$

\_\_\_\_\_

3.  $y = \frac{5}{3x-6}$

\_\_\_\_\_

Identify the asymptotes.

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

\_\_\_\_\_

5.  $y = \frac{2}{x+3} - 4$

\_\_\_\_\_

6.  $y = \frac{4}{x-6} + 3$

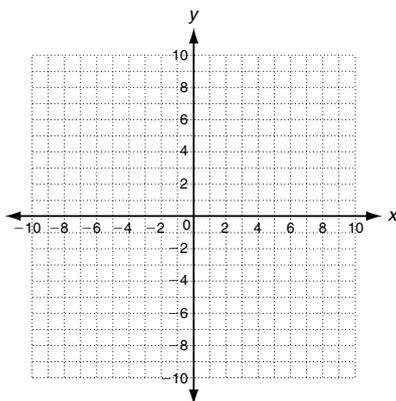
\_\_\_\_\_

Graph each function.

7.  $y = \frac{12}{x+3}$

- a. Vertical asymptote: \_\_\_\_\_
- b. Horizontal asymptote: \_\_\_\_\_
- c. Graph.

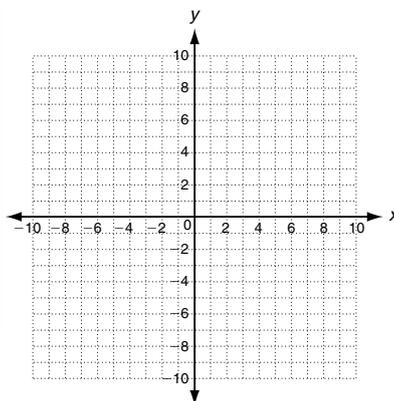
x	y



8.  $y = \frac{6}{x-1} - 3$

- a. Vertical asymptote: \_\_\_\_\_
- b. Horizontal asymptote: \_\_\_\_\_
- c. Graph.

x	y



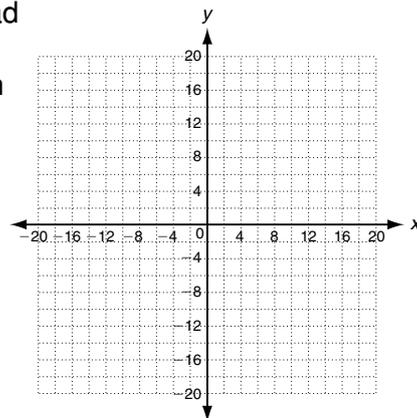
9. A music website is offering 5 free songs when you download any songs from their website. Catrina has \$25 to spend on songs. The number of songs  $y$  that she can buy is given by  $y = \frac{25}{x} + 5$ , where  $x$  is the price per song.

- a. Describe the reasonable domain and range values.

\_\_\_\_\_

\_\_\_\_\_

- b. Graph the function.



**LESSON**

**Practice B**

**12-3 Simplifying Rational Expressions**

Find any excluded values for each rational expression.

1.  $\frac{6}{3+x}$

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2.  $\frac{5}{x^2 - 4x}$

\_\_\_\_\_

3.  $\frac{x+6}{x^2 + 3x - 4}$

\_\_\_\_\_

Simplify each rational expression, if possible. Identify any excluded values.

4.  $\frac{7}{x-3}$

\_\_\_\_\_

5.  $\frac{5x^2 + 10x}{5x}$

\_\_\_\_\_

6.  $\frac{2x}{4x^2 + 6x}$

\_\_\_\_\_

Simplify each rational expression, if possible.

7.  $\frac{x+3}{x^2 - 2x - 15}$

\_\_\_\_\_

8.  $\frac{3x+6}{x^2 + 3x + 2}$

\_\_\_\_\_

9.  $\frac{x-6}{x^2 - 7x + 6}$

\_\_\_\_\_

10.  $\frac{x^2 - 49}{x^2 + 8x + 7}$

\_\_\_\_\_

11.  $\frac{x^2 + 4x - 5}{x^2 - 4x + 3}$

\_\_\_\_\_

12.  $\frac{x^2 - 2x}{x^2 + 2x - 8}$

\_\_\_\_\_

13.  $\frac{x^2 - x - 12}{4 - x}$

\_\_\_\_\_

14.  $\frac{5 - 5x}{x^2 - 1}$

\_\_\_\_\_

15.  $\frac{3 - x}{x^2 - 6x + 9}$

\_\_\_\_\_

16. When packaging food, a company wants a package that uses the least amount of material to hold the greatest volume of product. Some containers with mixed nuts are in the shape of a right circular cylinder.

a. Find the surface-area-to-volume ratio of a right circular cylinder. (Hint: For a right circular cylinder,  $S = 2\pi rh + 2\pi r^2$  and  $V = \pi r^2 h$ .)

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b. Container A has a radius of 2 in. and a height of 5 in. Container B has a radius of 4 in. and a height of 8 in. Which container should the company choose? Explain.

\_\_\_\_\_

\_\_\_\_\_

## LESSON

**Practice B****12-4*****Multiplying and Dividing Rational Expressions*****Multiply. Simplify your answer.**

1.  $\frac{8a^2b^5}{a^3} \cdot \frac{3a^2}{4b^9}$

\_\_\_\_\_

2.  $\frac{4x+8}{3} \cdot \frac{6x}{x+2}$

\_\_\_\_\_

3.  $\frac{7}{2t-6} \cdot (t^2 + t - 12)$

\_\_\_\_\_

4.  $\frac{3x^2 + xy^3}{y^3} \cdot \frac{2xy + 8y}{4x + x^2}$

\_\_\_\_\_

**Divide. Simplify your answer.**

5.  $\frac{5j^2k^2}{3jk^5} \div \frac{10j^2k}{9j^3}$

\_\_\_\_\_

6.  $\frac{3c^2 + 24c}{c^2 - 2c + 1} \div \frac{c^2 + 9c + 8}{9c - 9}$

\_\_\_\_\_

7. Ramon is playing a game in which he must pull two blocks out of a bag containing red and yellow blocks. He cannot look, and he cannot replace the block. The bag has 4 more red blocks than yellow blocks.

a. Write and simplify an expression that represents Ramon's probability of picking a red block, then a yellow block.

\_\_\_\_\_

b. What is the probability that Ramon pulls a red block then a yellow block if there are 6 yellow blocks in the bag before his first pick?

\_\_\_\_\_

c. What is the probability that Ramon pulls two yellow blocks if there are 6 yellow blocks in the bag before his first pick?

\_\_\_\_\_

**LESSON**

**Practice B**

**12-5 Adding and Subtracting Rational Expressions**

Add or subtract. Simplify your answer.

1.  $\frac{3m}{8m^3} + \frac{m}{8m^3}$

2.  $\frac{x^2 - 6x}{x + 3} + \frac{4x - 15}{x + 3}$

\_\_\_\_\_

\_\_\_\_\_

3.  $\frac{c^2 + c}{c^2 - 25} - \frac{c^2 + 5}{c^2 - 25}$

4.  $\frac{6a - 1}{a^2 + 7a + 10} - \frac{2a - 9}{a^2 + 7a + 10}$

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\_\_\_\_\_

Find the LCM of the given expressions.

5.  $4a^2b, 6a, 10b^3$

6.  $x^2 + 5x + 6, (x + 3)(x - 1)$

\_\_\_\_\_

\_\_\_\_\_

Add or subtract. Simplify your answer.

7.  $\frac{5}{3n} - \frac{2}{2n}$

8.  $\frac{y^2 + 4y}{y^2 + 6y + 8} + \frac{3}{y + 2}$

\_\_\_\_\_

\_\_\_\_\_

9.  $\frac{x + 2}{x^2 - 9} - \frac{1}{9 - x^2}$

10.  $\frac{1}{6y^2 + 24y} - \frac{3}{y^2 - y - 20}$

\_\_\_\_\_

\_\_\_\_\_

11. Kendrick walked 1 mile, and then jogged 5 miles. His jogging speed was 4 times his walking speed  $w$  in mi/h.

a. Write and simplify an expression that represents Kendrick's total exercise time.

\_\_\_\_\_

b. How many minutes did Kendrick exercise if his walking speed was 3 mi/h?

\_\_\_\_\_

## LESSON

**Practice B****12-6** *Dividing Polynomials*

Divide.

1.  $(15c^3 + 3c^2) \div 3c$

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2.  $(20b^4 - 12b + 4) \div 4b$

\_\_\_\_\_

3.  $(27q^6 - 3q^3 + 18) \div 9q^5$

\_\_\_\_\_

4.  $(15t^4 - 30t^2 + 6) \div 15t^3$

\_\_\_\_\_

5.  $(d^2 - 4d - 77) \div (d - 11)$

\_\_\_\_\_

6.  $(x^2 - 12x + 27) \div (x - 3)$

\_\_\_\_\_

7.  $(9p^2 + 6p + 1) \div (3p + 1)$

\_\_\_\_\_

8.  $(4b^2 + b - 3) \div (b + 1)$

\_\_\_\_\_

Divide using long division.

9.  $\frac{m^2 + 4m - 12}{m + 6}$

\_\_\_\_\_

10.  $(12y^2 + 31y + 14) \div (y + 2)$

\_\_\_\_\_

11.  $(t^2 + t - 6) \div (t - 1)$

\_\_\_\_\_

12.  $(3p^3 + 4p - 6) \div (p + 2)$

\_\_\_\_\_

## LESSON

**Practice B****12-7 Solving Rational Equations**

Solve. Check your answer.

1.  $\frac{6}{t+3} = \frac{4}{t}$

2.  $\frac{3}{m} = \frac{4}{m-2}$

3.  $\frac{a}{4} + \frac{1}{2} = \frac{2}{3}$

4.  $\frac{3}{2x} - \frac{3}{x-2} = \frac{1}{2x}$

5.  $\frac{3}{2x} + \frac{5}{x} = \frac{13}{x+4}$

6.  $\frac{3}{x} + \frac{3x+1}{x^2} = \frac{13}{x^2}$

Solve. Identify any extraneous solutions.

7.  $\frac{8}{x-2} = \frac{x+3}{x-2}$

8.  $\frac{-2}{x-1} = \frac{x-8}{x+1}$

9. Caroline can paint a fence in 6 hours. Her sister Lily can paint the same fence in 4 hours. How long will it take them to paint the fence if they work together?

10. Jalon bicycled against the wind for 10 miles in the same time he bicycled with the wind for 25 miles. The wind speed was 4 mi/h. What was Jalon's average bicycling speed?

(Hint: Use  $t = \frac{d}{r}$ .)

11. There are two positive numbers. The second number is 6 less than the first number. When the reciprocal of the second number is subtracted from the reciprocal of the first, the difference is  $-\frac{3}{8}$ . Find the first number.