

Skills

- **Lesson 1-1** Write the decimal expansion of each fraction. State whether the decimal expansion is a *terminating decimal* or a *repeating decimal*.

1. $\frac{1}{8}$

2. $\frac{19}{22}$

3. $\frac{11}{6}$

4. $\frac{15}{24}$

- **Lesson 1-2** Solve each equation by finding the positive square root of each side.

5. $x^2 = \frac{1}{4}$

6. $x^2 = \frac{25}{49}$

7. $x^2 = 0$

8. $x^2 = 81$

- **Lesson 1-3** Solve each equation.

9. $x^3 = 1$

10. $x^3 = 1,728$

11. $x^3 = \frac{125}{1,000}$

12. $x^3 = -\frac{8}{27}$

- **Lessons 1-4 and 1-5** Use the Pythagorean theorem to find the hypotenuse of the right triangle from the given lengths of the two legs.

13. 3, 4

14. 10, 24

15. 7, 13

16. 6, 11

17. $\sqrt{2}, \sqrt{7}$

18. 1.2, 1.6

19. 21, 22

20. 13, 31

Given leg ℓ and hypotenuse h determine the length of the missing leg of the right triangle.

21. $\ell = 7, h = 25$

22. $\ell = 7.5, h = 12.5$

23. $\ell = 23, h = 44$

24. $\ell = 50, h = 76$

- **Lesson 1-6** Determine whether the given lengths can be side lengths of a right triangle. Explain your reasoning.

25. 0.5, 1.2, 1.3

26. 8, 9, 12

27. 33, 56, 65

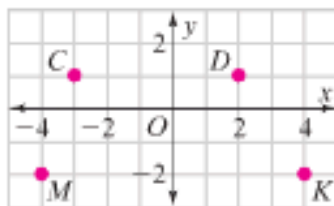
- **Lesson 1-7** Find the distance between each pair of points. If necessary, round to the nearest tenth.

28. C and K

29. M and D

30. K and D

31. C and M



Skills

● Lesson 2-1 Write an equation for each model.



Solve each equation.

3. $6n + 3 = 21$

4. $10 = \frac{m}{5} + 2$

5. $-b + 2 = -\frac{1}{2}$

6. $0.7g - 4 = 10$

7. $-10 = 2 + 2.4w$

8. $5d + 10 = 25$

9. $15 = -k + 18$

10. $4x - 2 = 8$

● Lesson 2-2 Simplify each expression.

11. $9c + 5c$

12. $-7w + 2.3w$

13. $\frac{5}{8}z - \frac{3}{8}z + \frac{7}{8}z$

14. $-8a + 6a - 14a$

15. $6x + 4 - 3x$

16. $7\left(h - \frac{2}{5}\right)$

17. $2(x + 1) + 5$

18. $-5 + 3(p - 2)$

19. $\frac{3}{4}q + \frac{1}{9} - \frac{3}{4}q$

20. $-(8z + 2z - 1)$

21. $47 - 1.1r - 2.7$

22. $-15h - (23 - 9h)$

● Lesson 2-3 Solve each equation. Check the solution.

23. $16 = -(2 - 2b)$

24. $9y + 4 - 7y = 123$

25. $3(m + 1.5) = 6$

26. $\frac{11}{12}r - 3 - \frac{5}{12}r = 7$

27. $-8 = 2c - 3c + 5$

28. $8 = \frac{2}{3}(h - 6)$

29. $4(2.2d - 1) = 22.4$

30. $17 = 4s - 3 - 6s$

31. $4.1x + 1.4 - 5.1x = 6.6$

● Lesson 2-4 Solve each equation. Check the solution.

32. $2a = 3(a + 1)$

33. $-9 - 3y = 19 + y$

34. $k = 1.5(7 - k)$

35. $14 - 2w = 18w - 26$

36. $8(3a - 5) = 56a$

37. $\frac{3}{4}t + 1 = \frac{5}{8}t - 2$

38. $30 - 5(p - 10) = 11p$

39. $15.3 - 2.4(6 - a) = 3a$

40. $1 - \frac{2}{3}\left(\frac{1}{2} + 2q\right) = -\frac{q}{3}$

● Lesson 2-5 Tell whether each equation has one solution, infinitely many solutions, or no solution. Justify your answer.

41. $16d = 8(d + 4)$

42. $-1.8x + 5.4 = -1.8(x - 3)$

43. $2\left(\frac{7}{16}a + 5\right) = \frac{7}{8}a - 10$

44. $2g + 7 = -4g + 7 + 6g$

45. $-3b + 0.4 = -3(b + 0.4)$

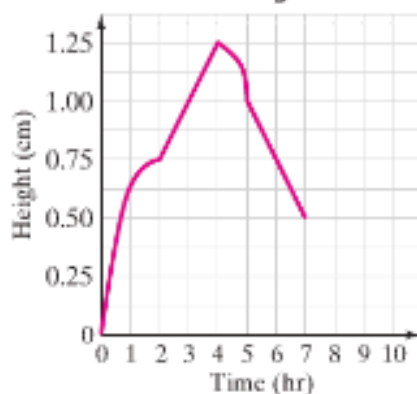
46. $-\frac{2}{3}(c + 6) = 2\left(\frac{c}{3} + 3\right)$

Skills

- **Lesson 3-1** Use the graph at the right for Exercises 1–4.

- When is the height increasing?
- When is the height decreasing?
- When is the change in height linear?
- When is the change in height nonlinear?

Level of Rain in Rain Gauge



- **Lesson 3-2** Use the function rule $y = 2x - 1$. Find each output.

5. $x = 1$

6. $x = 0$

7. $x = -3$

8. $x = \frac{1}{2}$

- **Lesson 3-3** Determine if each relationship is proportional.

9.

p	q
3	6
4	8
5	20
6	24

10.

s	t
-3	-15
-1	-5
1	5
3	15

11.

- **Lesson 3-4** Determine whether the function represented by each table is linear or nonlinear.

12.

x	0	1	2	3	4
y	12	9	6	3	0

13.

x	-6	-2	2	6	10
y	0	2	4	2	0

14.

x	8	11	14	17	20
y	9	6	3	0	-3

- **Lesson 3-5** Identify each function as linear or nonlinear.

15. $y = 2.5x + 4 - 1.2x$

16. $y = x^3 + 3 - x$

17.

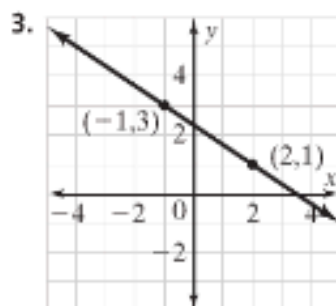
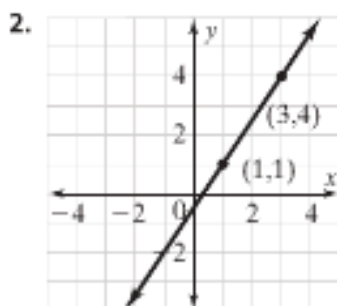
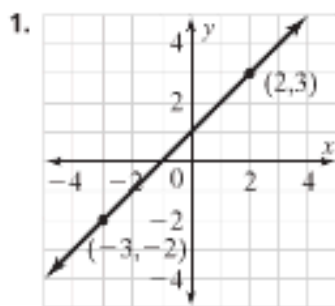
x	3	4	5	6
y	9	12	15	21

18.

x	7	9	11	13
y	5	3	1	-1

Skills

- **Lesson 4-1** Find the slope of each line.



Use the table to find the slope. Then graph the data and each line.

4.

x	0	1	2	3	4
y	1	3	5	7	9

5.

x	-2	0	2	4	6
y	10	7	4	1	-2

6.

x	-4	-1	2	5	8
y	-5	0	5	10	15

- **Lesson 4-2** Make a table of input-output pairs for each function. Then graph the function.

7. $y = 3x$

8. $y = -2x + 3$

9. $y = \frac{3}{5}x + 1$

10. $y = x + 5$

For each function, find the slope and y-intercept.

11. $y = 2x - 5$

12. $y = x + 8$

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

14. $y = 9x$

- **Lesson 4-3** Write a function rule for the data in the table. Find the initial amount and rate of change.

15.

Number of Hours, x	2	4	6	8
Miles Jogged, y	6	12	18	24

16.

Days, x	4	7	9	11
Blooms on Plant, y	20	29	35	41

- **Lesson 4-4** Determine which function has the greater rate of change.

17. $y = 4x + 3$

18. $y = \frac{1}{4}x - 2$

x	0	1	2	3	4
y	8	6	4	2	0

x	-3	-1	1	3	5
y	0	1	2	3	4

CHAPTER
5

Extra Practice

Skills

- **Lesson 5-1** Solve the system of equations by graphing.

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

2. $y = 2x - 3$
 $y = -2x + 1$

3. $y = \frac{1}{4}x + \frac{5}{4}$
 $y = 3x - 7$

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

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

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

- **Lesson 5-2** Solve each system of equations by substitution. Check your solution.

7. $y = -x + 5$
 $x + 2y = 2$

8. $3x + 5y = 22$
 $y = 4x - 2.5$

9. $4y - x = -2$
 $y = 3x + 5$

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

11. $-x + y = -8$
 $3x - y = 16$

12. $3y - \frac{5}{4}x = -1$
 $y + \frac{3}{4}x = 9$

- **Lesson 5-3** Solve each system of equations by elimination. Check your solution.

13. $x + y = 10$
 $x - y = -2$

14. $-2x + 3y = -12$
 $2x - 5y = 16$

15. $-x + \frac{3}{2}y = 8$
 $x - y = -7$

16. $x - 3y = 3$
 $2x + 3y = 9$

17. $3x + 4y = -1$
 $5x - 2y = 7$

18. $2x - 3y = 2$
 $-6x + 4y = -3$

- **Lesson 5-4** Choose a method to solve each linear system. Explain your choice and then solve the system.

19. $y = -2x + 4$
 $y = 3x + 9$

20. $3x - 4y = -3$
 $3x + 4y = 6$

21. $-3x + 2y = -6$
 $6x - y = 6$

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

23. $-x - 4y = 1$
 $5x + 2y = 13$

24. $4x + 2y = 5$
 $3x + y = 3$

Skills

● **Lesson 6-1** Write each number in standard form.

- | | | | |
|-----------------------|----------------------|-------------------------|---------------------------|
| 1. 7.2×10^5 | 2. 9×10^8 | 3. 4.9×10^{-3} | 4. 9.03×10^2 |
| 5. 4×10^{-5} | 6. 8.2×10^4 | 7. 1.7×10^6 | 8. 5.501×10^{-4} |

Write each number in scientific notation.

- | | | | |
|-----------------|--------------|------------|-------------|
| 9. 0.00002 | 10. 6,400 | 11. -503.4 | 12. 0.00997 |
| 13. 400,000,000 | 14. 0.000875 | 15. 38,000 | 16. -0.5002 |

● **Lesson 6-2** Write each expression using a single exponent.

- | | | | |
|----------------------------|---------------------------|------------------------------|------------------------|
| 17. $4^8 \cdot 4^{10}$ | 18. $(-9)^2 \cdot (-9)^4$ | 19. $3.2^8 \cdot 3.2^3$ | 20. $7^t \cdot 7^{3t}$ |
| 21. $8^{12} \cdot 8^{-12}$ | 22. $3^{-9} \cdot 3^{12}$ | 23. $(-5)^0 \cdot (-5)^{-2}$ | 24. $9^3 \cdot 9^{-8}$ |

Simplify each expression.

- | | | | |
|----------------|-----------------|---------------|-----------------|
| 25. $(-142)^0$ | 26. $(4c)^{-1}$ | 27. 7^{-w} | 28. $(-3)^{-5}$ |
| 29. ab^0 | 30. 6^{-3} | 31. $k3^{-3}$ | 32. 5^{-4} |

● **Lesson 6-3** Write each product in scientific notation.

- | | | |
|---|--------------------------------------|---|
| 33. $(3 \times 10^4)(2 \times 10^{12})$ | 34. $(5 \times 10^9)(7 \times 10^3)$ | 35. $8(9 \times 10^4)$ |
| 36. $(1 \times 10^3)(2.6 \times 10^8)$ | 37. $16(3 \times 10^2)$ | 38. $(7 \times 10^2)(8 \times 10^{10})$ |

Choose the most reasonable unit in parentheses to describe the quantity.

39. The mass of a baseball is about 145 _____. (grams, kilograms)
 40. The length of a carpenter ant is about 18 _____. (meters, millimeters)

● **Lesson 6-4** Write each expression using a single exponent.

- | | | | |
|-----------------------|---------------------------------|------------------------------------|--------------------------|
| 41. $\frac{4^7}{4^5}$ | 42. $\frac{8.1^{15}}{8.1^{12}}$ | 43. $\frac{(-654)^{20}}{(-654)^1}$ | 44. $\frac{2^{3x}}{2^x}$ |
|-----------------------|---------------------------------|------------------------------------|--------------------------|

● **Lesson 6-5** Divide. Write each quotient in scientific notation.

- | | | |
|---|--|--|
| 45. $(7 \times 10^3) \div (4 \times 10^8)$ | 46. $(6 \times 10^8) \div (2 \times 10^6)$ | 47. $(2.1 \times 10^3) \div (5.2 \times 10^1)$ |
| 48. $(8 \times 10^3) \div (2 \times 10^{-2})$ | 49. $(7.5 \times 10^4) \div 3.2$ | 50. $(8 \times 10^9) \div (8 \times 10^4)$ |

Estimate how many times greater the first number is than the second number.

Round to the nearest multiple of ten.

- | | | |
|---|---|---|
| 51. 3.8×10^5 and 6.3×10^3 | 52. 6×10^8 and 2×10^7 | 53. 3.8×10^4 and 9.4×10^2 |
| 54. 4×10^7 and 8×10^5 | 55. 9.0×10^7 and 4.5×10^6 | 56. 2.7×10^7 and 3.8×10^5 |

Skills

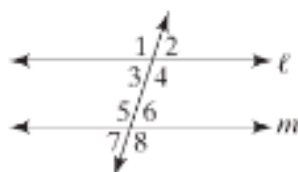
- **Lesson 7-1** For Exercises 1–3, use the diagram at the right.

1. Find the measure of the complement of $\angle PLK$.
2. Name a pair of vertical angles.
3. Find the measures of $\angle LPM$ and $\angle MPN$.



- **Lesson 7-2** In the diagram at the right, $\ell \parallel m$.

4. Identify a pair of alternate interior angles.
5. If $m\angle 1 = 108^\circ$, find the measure of each numbered angle.



- **Lesson 7-3** Show that each pair of triangles is congruent.

- 6.
- 7.
- 8.

- **Lesson 7-4** Exercises 9–11 show pairs of similar polygons. Find the unknown lengths.

- 9.
- 10.
- 11.

- **Lesson 7-5** Show that each pair of triangles is similar.

- 12.
- 13.

- **Lesson 7-6** Find the sum of the measures of the interior angles of each polygon.

14. rhombus
15. hexagon
16. triangle
17. pentagon
18. trapezoid

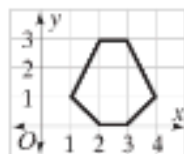
Skills

- **Lesson 8-1** Graph each point and its image after the given translation. Name the coordinates of the image.

1. $D(3, 2)$, right 3 units 2. $E(-5, 4)$, down 4 units 3. $F(0, 6)$, up 1 unit, left 4 units

Copy the figure shown below for Exercises 4–6. Then graph its image after each translation.

4. translation 2 units left
5. translation 3 units up
6. translation 3 units right and 1 unit down



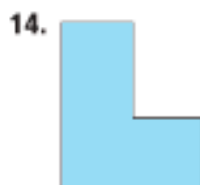
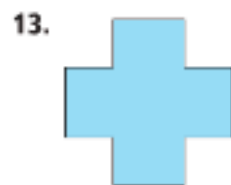
- **Lesson 8-2** Graph the given point and its image after each reflection over the given axis. Name the coordinates of the image.

7. $G(2, 5)$, x -axis 8. $H(-4, 3)$, y -axis 9. $J(0, -7)$, x -axis

$\triangle ABC$ has vertices $A(1, 2)$, $B(2, 7)$, and $C(5, 1)$. Graph $\triangle ABC$ and its image after a reflection over each line. Name the coordinates of the vertices of the image.

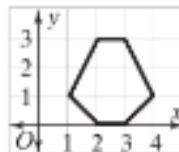
10. x -axis 11. y -axis 12. line through $(-1, 5)$ and $(-1, -2)$

- **Lesson 8-3** Determine whether each figure has rotational symmetry. If it does, find the angle of rotation. Write *no rotational symmetry* if applicable.



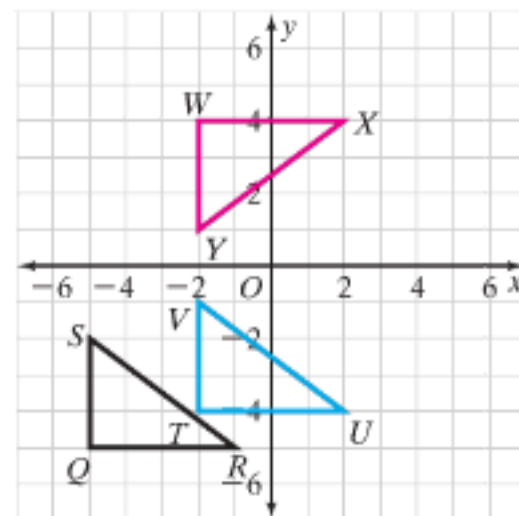
Copy the figure shown at the right for Exercises 16–18. Then draw its image after a rotation of the given number of degrees about the origin.

16. 90° 17. 180° 18. 270°



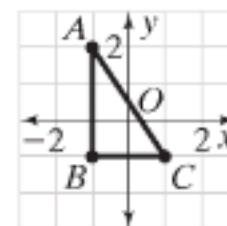
● **Lesson 8-4**

19. The three triangles are congruent. Describe the sequence of transformations that maps $\triangle QRS$ onto $\triangle WXY$.



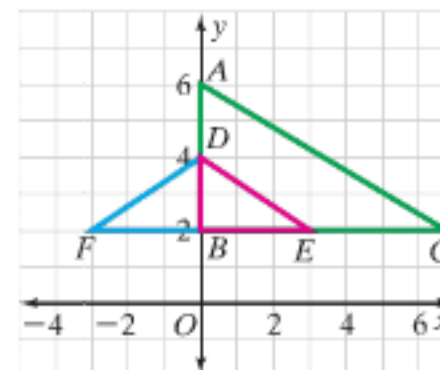
● **Lesson 8-5** Find the image of $\triangle ABC$ at the right after a dilation with the given center and scale factor.

20. center B , scale factor of 3 21. center A , scale factor of $\frac{1}{2}$



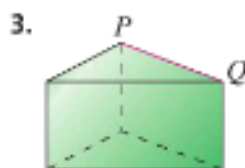
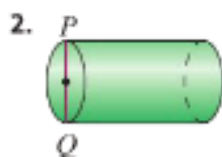
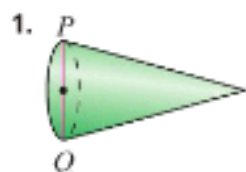
● **Lesson 8-6**

22. The three triangles are similar. Describe the sequence of transformations that maps $\triangle ABC$ onto $\triangle DBF$.

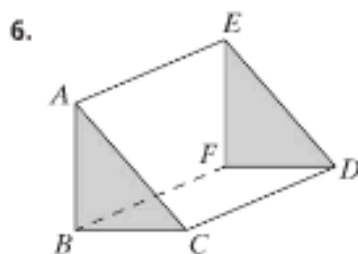
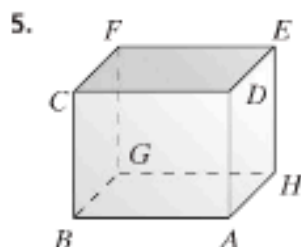
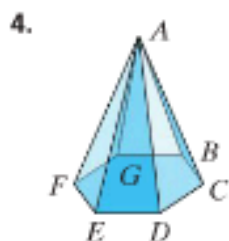


Skills

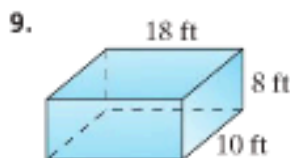
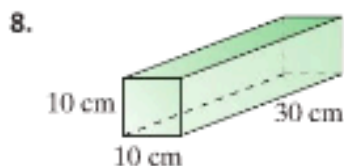
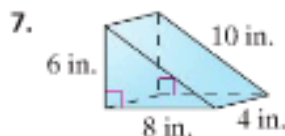
- **Lesson 9-1** For each figure, describe the base, name the figure, and name \overline{PQ} .



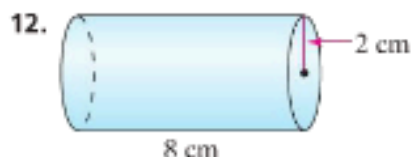
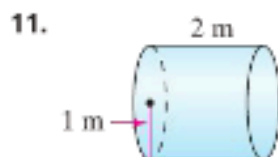
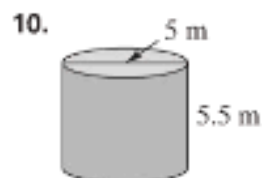
For each figure, name a pair of skew line segments and a pair of parallel line segments.



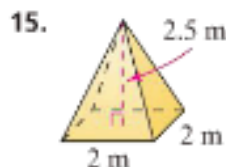
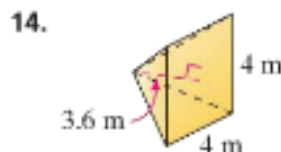
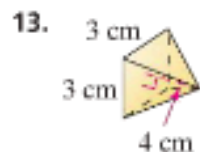
- **Lesson 9-2** Find the volume of each prism.



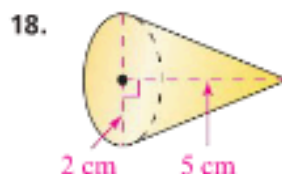
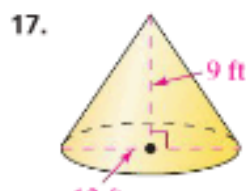
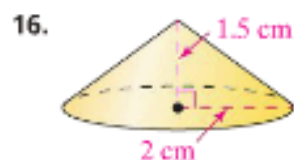
Find the volume of each cylinder to the nearest whole cubic unit.



- **Lesson 9-3** Find the volume of each pyramid to the nearest whole cubic unit.

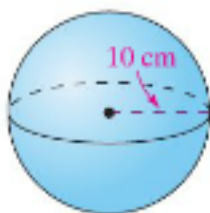


Find the volume of each cone to the nearest whole cubic unit.

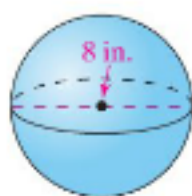


- **Lesson 9-4** Find each sphere's surface area and volume to the nearest whole number.

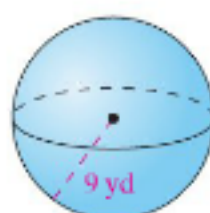
19.



20.



21.



- **Lesson 9-5**

22. Find the volume of the smaller similar solid at the right.

$$V = 3,570 \text{ m}^3$$



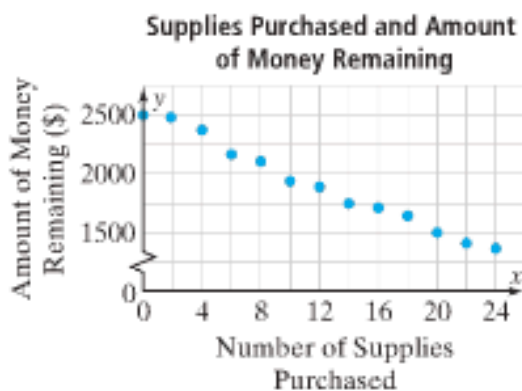
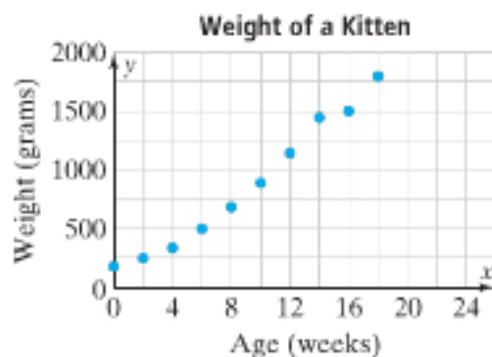
14 m

7 m

Skills

● **Lesson 10-1** Use the given scatter plots for Exercises 1 and 2.

1. What does the point (16, 1,500) represent? 2. What does the point (8, 105) represent?

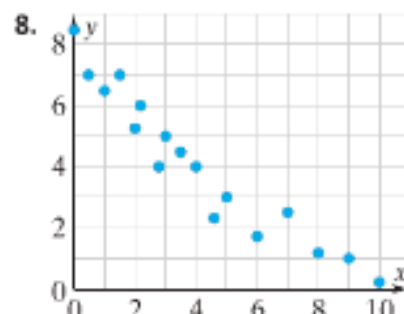
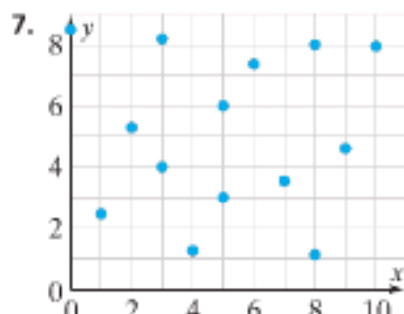
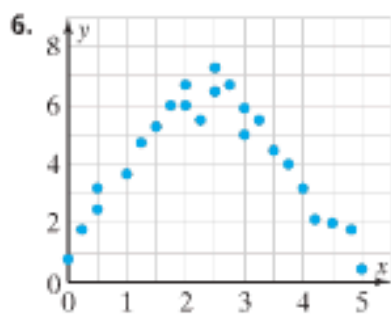


● **Lesson 10-2** Use the data in the table for Exercises 3–5.

3. Make a scatter plot for the data in the table.
4. Use the scatter plot to identify any clustering or outliers.
5. Describe the pattern of association that the scatter plot shows.

Number of Cups of Coffee Sold at Coffee Shop									
Hour	1	2	4	6	8	10	12	14	17
Number of Cups Sold	35	42	48	51	30	62	64	70	73

Tell whether a linear model, nonlinear model, or neither is most appropriate for modeling the data in the scatter plot.



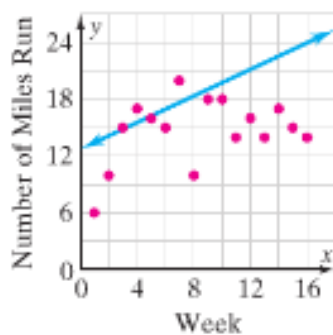
● **Lesson 10-3** Use the data below for Exercises 9–11.

9. Make a scatter plot for the data in the table. If possible, draw a trend line and describe the trend.

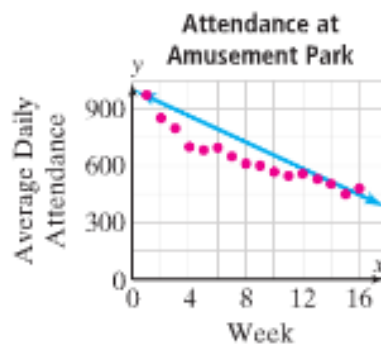
Average Price of One Gallon of Unleaded Gasoline									
Month	1	20	42	61	80	95	110	120	127
Average Price (\$)	1.751	1.891	2.176	2.274	3.786	2.660	3.167	3.278	3.451

Find a trend line that fits the data better than the line shown.

10. Number of Miles Run



11.



● **Lesson 10-4** Use the data below for Exercises 12 and 13.

One hundred students were surveyed about their favorite type of pet.

- 12 girls and 15 boys chose “dog.”
- 10 girls and 8 boys chose “bird.”
- 13 girls and 14 boys chose “cat.”
- 14 girls and 14 boys chose “guinea pig.”

12. Make a two-way table of frequencies for the data.

13. According to the survey, what is the most popular type of pet?