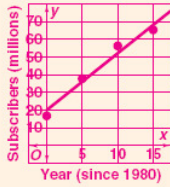
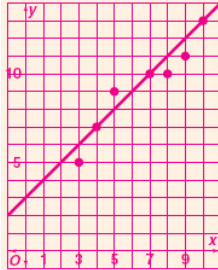


26a, b.



Answers may vary.
Sample:
 $y = x + 21$

27.



Answers may vary.
Sample: reasonable;
 $y = x + 3$; 18

28.



Answers may vary.
Sample: reasonable;
 $y = -0.92x + 21$; 7.2

2-2 Objectives

- ▼ To graph linear equations (p. 62)
- ▼ To write equations of lines (p. 64)

The graph of a **linear function** is a line. You can represent a linear function with a **linear equation**. In a function, the value of y depends on the value of x , so y is the **dependent variable** and x is the **independent variable**.

Given two points on a line, the **slope** of the line is the ratio of the difference of the y -coordinates to the corresponding difference of the x -coordinates. The slope equals the coefficient of x when you write a linear equation in **slope-intercept form**. You can also write a linear equation in **point-slope form** or **standard form**. You can use the slopes of lines to determine whether or not they are parallel, perpendicular, or horizontal. A vertical line has no slope.

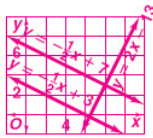
Write in standard form an equation for each line.

14. slope = -3 , through $(4, 0)$ 15. through $(2, 3)$ and $(3, 5)$
 $3x + y = 12$ $2x - y = 1$

Find the slope, x -intercept, and y -intercept of each line.

16. $4x - 2y = 3$ 17. $Mx = Ny + P$ 18. $5 - x = y$
 $2; (\frac{3}{4}, 0), (0, -\frac{3}{2})$ $\frac{M}{N}; (\frac{P}{N}, 0), (0, -\frac{P}{N})$ $-1; (5, 0), (0, 5)$
19. a. Write an equation of the line parallel to $x + 2y = 6$ through $(8, 3)$.
 b. Write an equation of the line perpendicular to $x + 2y = 6$ through $(8, 3)$.
 c. Graph the three lines on the same coordinate plane.
 a. $y = -\frac{1}{2}x + 7$ b. $y = 2x - 13$

19c.



2-3 Objectives

- ▼ To write and interpret direct variation equations (p. 72)

A linear equation of the form $y = kx$ represents a **direct variation**. The **constant of variation** is k . You can use proportions to solve some direct variation problems.

For each function, determine whether y varies directly with x . If so, find the constant of variation and write the equation.

20.

x	y
-2	3
0	4
2	7

 no 21.

x	y
4	5
6	9
10	17

 no 22.

x	y
0	0
1	1
5	5

 yes; 1, $y = x$

Find each constant of variation. Then find the value of y when $x = -0.3$.

23. $y = 2$ when $x = -\frac{1}{2}$ 24. $y = \frac{2}{3}$ when $x = 0.2$ 25. $y = 7$ when $x = 2$
 -4 ; 1.2 $\frac{10}{3}$; -1 $\frac{7}{2}$; $-\frac{1}{20}$

2-4 Objectives

- ▼ To write linear equations that model real-world data (p. 78)
- ▼ To make predictions from linear models (p. 79)

You can use mathematical models such as **scatter plots** to show relationships between data sets. You can use the models to make predictions about the data set. Sometimes you can draw a **trend line** to model the relation and make predictions.

26. a. **Data Analysis** Draw a scatter plot of the data below. a–b. See margin.
 b. Draw a trend line. Write its equation.
 c. Estimate the number of cable TV subscribers in 2010. **Answers may vary. Sample: about 111 million**

Cable TV Subscribers

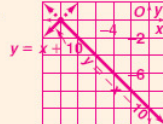
Year	1980	1985	1990	1995	2000
Millions of Subscribers	17.5	35.4	50.5	60.6	66.3

SOURCE: Television Bureau of Advertising

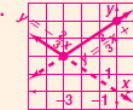
29.



30.



31.



Draw a scatter plot of each set of data. Decide whether a linear model is reasonable. If so, draw a trend line and write its equation. Then predict the value of y when x is 15. 27–28. See margin p. 110.

27.

x	3	4	5	7	8	9	10
y	5	7	9	10	10	11	13

28.

x	6	7	8	9	10	11	12
y	15.5	14.0	13.0	12.5	12.0	11.5	10.0

2-6 Objectives

Graph absolute value functions (p. 88)

Analyze translations

Analyze stretches, compressions, and reflections

The **absolute value function** $y = |x|$ has a graph in the shape of a V. It is the **parent function** for the family of functions of the form $y = a|x - h| + k$. The maximum or minimum point of the V is the **vertex** of the graph.

The value of h represents a horizontal translation of the parent graph by h units left (h is positive) or right (h is negative). The k represents a vertical translation of the graph by k units up (k is positive) or down (k is negative). The a represents a vertical stretch for $a > 1$; a vertical shrink for $0 < a < 1$. $y = -a|x|$ is a reflection of $y = a|x|$ in the x -axis.

Graph each equation by writing two linear equations. 29–31. See margin p. 110.

29. $y = |x - 7|$ 30. $y = -|x + 10|$ 31. $y = \frac{1}{3}|2x + 6| + 2$

Write an equation for each translation of the graph of $y = |x|$.

32. 4 units up, 2 units right 33. vertex $(-3, 0)$ $y = |x + 3|$
 34. vertex $(5, 2)$ $y = |x - 5| + 2$ 35. vertex $(4, 1)$ $y = |x - 4| + 1$

Graph each function. 36–38. See margin. 39–41. See back of book.

36. $f(x) = |x| - 8$ 37. $f(x) = 2|x - 5|$ 38. $f(x) = \frac{1}{2}|x - 3| + 3$
 39. $y = 3|x + 4|$ 40. $y = -\frac{1}{4}|x - 2| + \frac{1}{2}$ 41. $y = -2|x + 1| - 1$

Activities

Graph linear inequalities (p. 101)

Graph absolute value inequalities (p. 103)

A **linear inequality** describes a region of the coordinate plane that has a boundary. To graph an inequality involving two variables, first graph the boundary. Then decide which side of the boundary contains solutions. Points on a dashed boundary are not solutions. Points on a solid boundary are solutions.

Graph each inequality. 42–46. See margin.

42. $y \geq -2$ 43. $y < 3x + 1$ 44. $y \leq -|x - 5|$ 45. $y > |2x + 1|$

46. **Transportation** An air cargo plane can transport as many as 15 regular shipping containers. One super-size container takes up the space of 3 regular containers.
 a. Write an inequality to model the situation.
 b. Describe the domain and range.
 c. Graph the inequality you wrote in part (a).

47. **Open-Ended** Write an absolute value inequality with a solid boundary that has solutions below the x -axis only. **Answers may vary. Sample:** $y \leq -|x| - 1$

Alternative Assessment L4

Algebra 2 Assessment
 Chapter 2

Write a paragraph.

Table 1

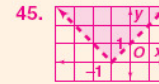
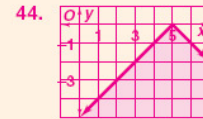
Write a paragraph describing the graph of the function.

- Write the equation of the function.
- Describe the domain and range.
- Write the equation of the line of symmetry.
- Write the vertex of the parabola.
- Write the equation of the axis of symmetry.

Table 2

Write a paragraph describing the graph of the function.

- Write the equation of the function.
- Describe the domain and range.
- Write the equation of the line of symmetry.
- Write the vertex of the parabola.
- Write the equation of the axis of symmetry.



46a. **Answers may vary. Sample:** $x + 3y \leq 15$

46b. **Answers may vary. Sample:** domain $\{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15\}$, range $\{0, 1, 2, 3, 4, 5\}$

