

# CHAPTER 2

## Think & Discuss (p. 65)

1. Enrollment tends to increase throughout the period.
2. Estimate the growth trend with a line, and use the line to predict future enrollment.

## Skill Review (p. 66)

$$1. \frac{y-7}{x-3} = \frac{5-7}{2-3} = \frac{-2}{-1} = 2$$

$$2. \frac{5-y}{6-x} = \frac{5-1}{6-4} = \frac{4}{2} = 2$$

$$3. \frac{8-y}{3-x} = \frac{8+4}{3+1} = \frac{12}{4} = 3$$

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

$$y = 4 - 3x$$

$$6. 5x + 6y = -60$$

$$6y = -60 - 5x$$

$$y = -10 - \frac{5}{6}x$$

$$8. 6 - 0.5y \leq 19$$

$$-0.5y \leq 13$$

$$y \geq -26$$

$$5. x - 2y = 10$$

$$-2y = 10 - x$$

$$y = -5 + \frac{1}{2}x$$

$$7. 2x + 9 < 18$$

$$2x < 9$$

$$x < \frac{9}{2}$$

$$9. 2x + 3 > 6x - 7$$

$$-4x > -10$$

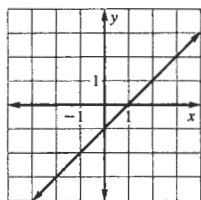
$$x < \frac{5}{2}$$

## Lesson 2.1

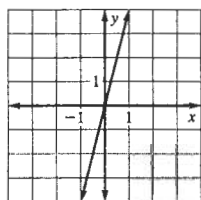
### 2.1 Guided Practice (p. 71)

1. The domain is the set of input values and the range is the set of output values.
2. *Sample answer:* A relation is not a function if any input values map to more than a single output value. If this is the case, the vertical line at that input value will contain more than one point of a graph.
3. *Sample answer:* First, construct a table of values for the equation. Then plot enough of these points that a pattern can be seen. Then connect the points with a line or a curve.
4. domain:  $-3, -2, -1, 1, 2, 3$   
range:  $-2, 0, 2$   
function

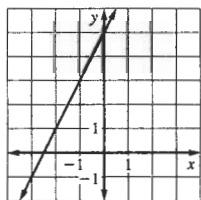
x	-2	-1	0	1	2
y	-3	-2	-1	0	1



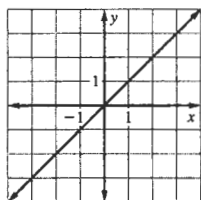
x	-2	-1	0	1	2
y	-8	-4	0	4	8



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



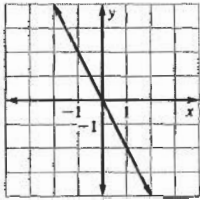
x	-2	-1	0	1	2
y	-2	-1	0	1	2



# Chapter 2 continued

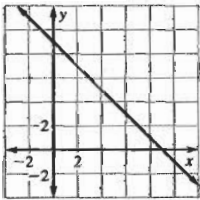
9.

x	-2	-1	0	1	2
y	4	2	0	-2	-4



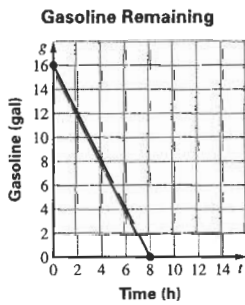
10.

x	-2	-1	0	1	2
y	11	10	9	8	7



11.  $f(3) = 3$     12.  $f(3) = 6(3) = 18$     13.  $f(3) = (3)^2 = 9$   
 14.  $g(3) = 2(3) + 7 = 6 + 7 = 13$   
 15.  $h(3) = -(3)^2 + 10 = -9 + 10 = 1$   
 16.  $j(3) = (3)^3 - 7(3) = 27 - 21 = 6$   
 17. domain:  $0 \leq t \leq 8$   
 range:  $0 \leq g \leq 16$

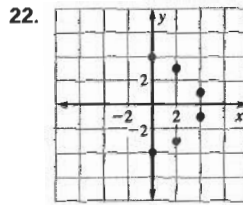
t	0	2	4	6	8
g	16	12	8	4	0



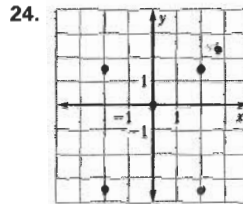
18.  $2 = 16 - 2t$   
 $2t = 14$   
 $t = 7$  h

### 2.1 Practice and Applications (pp. 71-74)

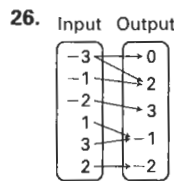
19. domain: -1, 2, 5, 6    20. domain: -3, 1, 5  
 range: -2, 3    range: -2, -1, 3, 4  
 21. domain: 1, 2, 3, 4  
 range: 1, 2, 3, 4



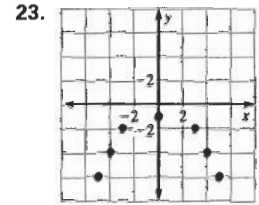
no



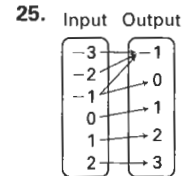
no



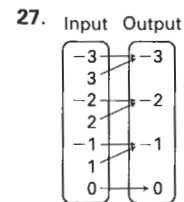
no



yes



no

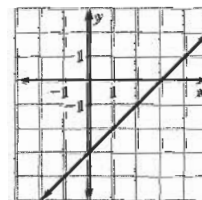


yes

28. Yes; no; *Sample answer:* A function is always a relation, but a relation is not always a function. Any set of ordered pairs is a relation, but only those sets that do not map the same input value to more than one output value are functions.  
 29. *Sample answer:* If a relation is a function, then no vertical line intersects the graph of the relation at more than one point. If no vertical line intersects the graph of the relation at more than one point, then the relation is a function.  
 30. no    31. yes    32. no  
 33.  $y = 3$  maps each input value to a single output value namely 3, while  $x = 3$  matches the input value 3 to infinitely many output values.

34.

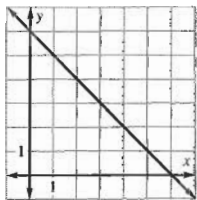
x	-2	-1	0	1	2
y	-5	-4	-3	-2	-1



## Chapter 2 continued

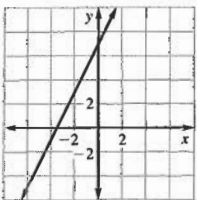
35.

x	-2	-1	0	1	2
y	8	7	6	5	4



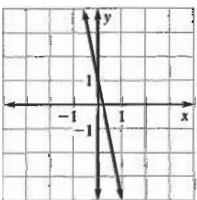
36.

x	-2	-1	0	1	2
y	3	5	7	9	11



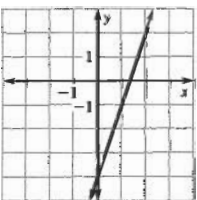
37.

x	-2	-1	0	1	2
y	11	6	1	-4	-9



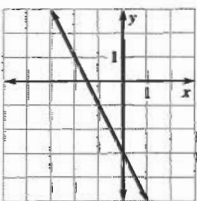
38.

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



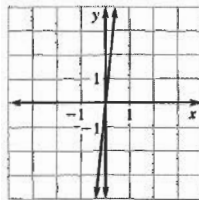
39.

x	-2	-1	0	1	2
y	1	-1	-3	-5	-7



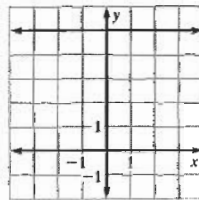
40.

x	-2	-1	0	1	2
y	-20	-10	0	10	20



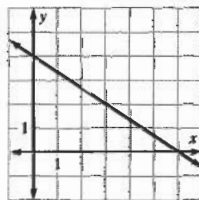
41.

x	-2	-1	0	1	2
y	5	5	5	5	5



42.

x	-2	-1	0	1	2
y	$\frac{16}{3}$	$\frac{14}{3}$	4	$\frac{10}{3}$	$\frac{8}{3}$



43. linear;  $f(4) = 4 - 11 = -7$     44. linear;  $f(-4) = 2$

45. not linear;  $f(-6) = |-6| - 5 = 1$

46. not linear;  $f(2) = 9(2)^3 - (2)^2 + 2$   
 $= 9(8) - 4 + 2 = 70$

47. not linear;  $f(6) = -\frac{2}{3}(6)^2 - 6 + 5 = -\frac{2}{3}(36) - 1$   
 $= -24 - 1 = -25$

48. linear;  $f(-\frac{1}{2}) = -3 + 4(-\frac{1}{2}) = -3 - 2 = -5$

49.  $V(5) = 5^3 = 125$ ; the volume of a cube with sides of length 5 units

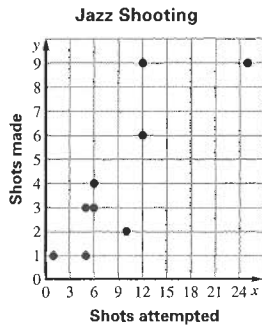
50.  $V(2) = \frac{4}{3}\pi(2)^3 = \frac{32\pi}{3}$ ; the volume of a sphere with radius 2 units

51. No; *Sample answer:* Not every age corresponds to exactly one place. For example, there were 24-year-olds with finishes of first and third.

52. Yes; *Sample answer:* Each Congress number corresponds to one number of Independents.

## Chapter 2 continued

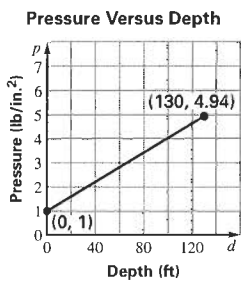
53. domain: 1, 5, 6, 10, 12, 25  
range: 1, 2, 3, 4, 6, 9



54. No; *Sample answer:* The input value 6 is mapped to 2 different output values, 3 and 4.

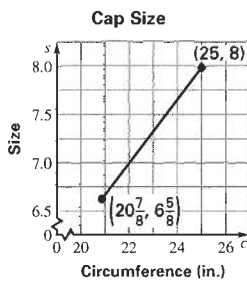
55. domain:  $0 \leq d \leq 130$   
range:  $1 \leq p \leq 4\frac{31}{33}$

$d$	0	26	52	78	104	130
$p$	1	$\frac{59}{33}$	$\frac{85}{33}$	$\frac{111}{33}$	$\frac{137}{33}$	$\frac{163}{33}$



56.  $p = \frac{1}{33}(100) + 1$   
 $p = 4\frac{1}{33}$  atmospheres  $\approx 59.2$  lb/in.<sup>2</sup>
57. domain:  $20\frac{7}{8} \leq c \leq 25$   
range:  $6\frac{5}{8} \leq s \leq 8$

$c$	$20\frac{7}{8}$	$21\frac{7}{10}$	$22\frac{21}{40}$	$23\frac{7}{20}$	$24\frac{7}{40}$	25
$s$	$6\frac{5}{8}$	$6\frac{9}{10}$	$7\frac{7}{40}$	$7\frac{9}{20}$	$7\frac{29}{40}$	8

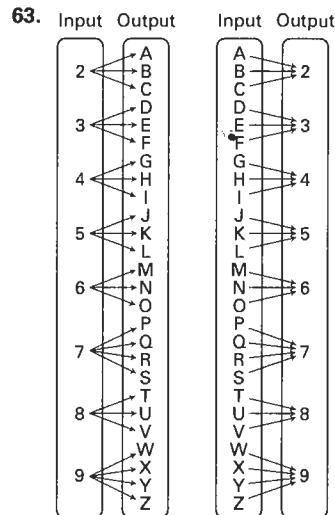


58.  $7 = \frac{c-1}{3}$     59. C    60. B    61. A    62. C

$$21 = c - 1$$

$$22 = c$$

$$22 \text{ in.}$$



Letters to digits is a function, since each letter is mapped to a single digit. Digits to letters is not a function, since each digit corresponds to three or four different letters.

### Mixed Review (p. 74)

64.  $\frac{-2-6}{-3-9} = \frac{-8}{-12} = \frac{2}{3}$     65.  $\frac{5-11}{-4-2} = \frac{-6}{-6} = 1$

66.  $\frac{5-(-5)}{2-3} = \frac{10}{-1} = -10$

67.  $\frac{4-(-1)}{6-(-4)} = \frac{4+1}{6+4} = \frac{5}{10} = \frac{1}{2}$     68.  $\frac{4-3}{1-2} = \frac{1}{-1} = -1$

69.  $\frac{10-8}{14-6} = \frac{2}{8} = \frac{1}{4}$

70.  $2x + 13 = 31$

$$2x = 18$$

$$x = 9$$

71.  $-2.4x + 11.8 = 29.8$

$$-2.4x = 18.0$$

$$x = -7.5$$

72.  $x + 17 = 10 - 3x$

$$4x = -7$$

$$x = -\frac{7}{4}$$

73.  $\frac{5}{2} - 7x = 40 + x$

$$-8x = \frac{75}{2}$$

$$x = -\frac{75}{16} = -4\frac{11}{16}$$

74.  $-\frac{1}{3}(x-15) = -48$

$$-\frac{1}{3}x + 5 = -48$$

$$-\frac{1}{3}x = -53$$

$$x = 159$$

75.  $6x + 5 = 0.5(x+6) - 4$

$$6x = 0.5x + 3 - 4 - 5$$

$$5.5x = -6$$

$$x = -\frac{6}{5.5} = -1\frac{1}{11}$$

## Chapter 2 continued

76.  $3x - 4 < 10$   
 $3x < 14$   
 $x < \frac{14}{3}$   
 no
77.  $\frac{1}{2}x - 8 \leq 0$   
 $\frac{1}{2}x \leq 8$   
 $x \leq 16$   
 yes
78.  $10 - x \geq 6$   
 $-x \geq -4$   
 $x \leq 4$   
 yes
79.  $3 + 2x > -5$   
 $2x > -8$   
 $x > -4$   
 yes
80.  $-5 \leq x + 8 < 15$   
 $-13 \leq x < 7$   
 yes
81.  $x - 2.7 < -1$  or  $3x > 6.9$   
 $x < 1.7$      $x > 2.3$   
 yes

### Lesson 2.2

#### 2.2 Guided Practice (p. 79)

- Sample answer:* The slope is a measure of the rate of change of  $y$  with respect to  $x$ . The slope is positive if  $y$  increases as  $x$  increases, and is negative if  $y$  decreases as  $x$  increases. This corresponds to the definition of slope = (change in  $y$ )/(change in  $x$ ).
- horizontal; vertical
- They are parallel if their slopes are equal; they are perpendicular if their slopes are negative reciprocals.
- $m = \frac{3-2}{14-4} = \frac{1}{10}$ ; rises  
 5.  $m = \frac{1-4}{8-8} = \frac{-3}{0}$ ; undefined; vertical
- $m = \frac{-5-4}{3+3} = \frac{-9}{6} = -\frac{3}{2}$ ; falls
- $m = \frac{8-4}{-6+2} = \frac{4}{-4} = -1$ ; falls
- $m = \frac{3-3}{4+7} = \frac{0}{11} = 0$ ; horizontal
- $m = \frac{-7-9}{-2-6} = \frac{-16}{-8} = 2$ ; rises
- $m_1 = \frac{4-0}{3+5} = \frac{4}{8} = \frac{1}{2}$   
 $m_2 = \frac{6-4}{1-0} = 2$ ; Line 2 is steeper.
- $m_1 = \frac{7-4}{1-2} = \frac{3}{-1} = -3$   
 $m_2 = \frac{12-2}{3-5} = \frac{10}{-2} = -5$ ; Line 2 is steeper.
- $m_1 = \frac{-2-5}{-4-1} = \frac{-7}{-5} = \frac{7}{5}$   
 $m_2 = \frac{-7-0}{-2-3} = \frac{-7}{-5} = \frac{7}{5}$ ; parallel

13.  $m_1 = \frac{7+2}{-2-2} = \frac{9}{-4}$   
 $m_2 = \frac{1+5}{5-4} = \frac{6}{1} = 6$ ; neither
14.  $m_1 = \frac{-1-6}{2-3} = \frac{-7}{-1} = 7$   
 $m_2 = \frac{1-2}{6+1} = \frac{-1}{7}$ ; perpendicular
15.  $m_1 = \frac{4-0}{3-9} = \frac{4}{-6} = -\frac{2}{3}$   
 $m_2 = \frac{0-6}{4+5} = \frac{-6}{9} = -\frac{2}{3}$ ; parallel
16. distance = 312 km  
 time = 6 hr  
 $\text{rate} = \frac{\text{distance}}{\text{time}} = \frac{312 \text{ km}}{6 \text{ hr}} = 52 \text{ km/h}$

#### 2.2 Practice and Applications (p. 79–81)

17. Use points (1, 0) and (0, -1).  
 $m = \frac{-1-0}{0-1} = \frac{-1}{-1} = 1$
18. Use points (-3, 0) and (0, -1).  
 $m = \frac{-1-0}{0+3} = \frac{-1}{3}$
19. Use points (2, 1) and (2, -1).  
 $m = \frac{-1-1}{2-2} = \frac{-2}{0}$ ; undefined
20.  $m = \frac{3-2}{-4-3} = \frac{-1}{-7}$ ; falls
21.  $m = \frac{6+4}{2-1} = \frac{10}{1} = 10$ ; rises
22.  $m = \frac{11+3}{4-14} = \frac{14}{-10} = -\frac{7}{5}$ ; falls
23.  $m = \frac{-6+12}{2+10} = \frac{6}{12} = \frac{1}{2}$ ; rises
24.  $m = \frac{3-3}{-2+7} = \frac{0}{5} = 0$ ; horizontal
25.  $m = \frac{6+6}{-6-6} = \frac{12}{-12} = -1$ ; falls
26.  $m = \frac{1-2}{-18-4} = \frac{-1}{-22} = \frac{1}{22}$ ; rises
27.  $m = \frac{2-8}{-9+9} = \frac{-6}{0}$ ; undefined; vertical
28.  $m = \frac{-\frac{5}{4}-\frac{16}{4}}{2-3} = \frac{-\frac{21}{4}}{-1} = \frac{21}{4}$ ; rises

## Chapter 2 continued

$$29. m = \frac{\frac{5}{2} - \frac{7}{2}}{2 - 0} = \frac{-\frac{2}{2}}{2} = -\frac{1}{2}; \text{ falls}$$

$$30. m = \frac{-2 + 1}{\frac{3}{5} - \frac{1}{5}} = \frac{-1}{\frac{2}{5}} = -\frac{5}{2}; \text{ falls}$$

$$31. m = \frac{-\frac{8}{3} + \frac{9}{3}}{\frac{4}{3} - \frac{4}{3}} = \frac{\frac{1}{3}}{0}; \text{ undefined; vertical}$$

32. *b* 33. *c* 34. *d* 35. *a*

36. If a line is horizontal, only the  $x$  values will be different; the  $y$ -values will remain the same.

$$\frac{y - y}{1 - 2} = \frac{0}{-1} = 0$$

If a line is vertical, only the  $y$  values will be different; the  $x$ -values will remain the same.

$$\frac{1 - 2}{x - x} = \frac{-1}{0}; \text{ undefined.}$$

$$37. m_1 = \frac{8 - 6}{2 + 2} = \frac{2}{4} = \frac{1}{2}$$

$$m_2 = \frac{-3 + 4}{5 - 0} = \frac{1}{5}; \text{ Line 1 is steeper.}$$

$$38. m_1 = \frac{6 - 1}{-8 - 4} = -\frac{5}{12}$$

$$m_2 = \frac{-8 - 4}{-1 + 2} = \frac{-12}{1} = -12; \text{ Line 2 is steeper.}$$

$$39. m_1 = \frac{-10 + 10}{2 - 3} = \frac{0}{-1} = 0$$

$$m_2 = \frac{12 - 8}{2 + 6} = \frac{4}{8} = \frac{1}{2}; \text{ Line 2 is steeper.}$$

$$40. m_1 = \frac{-9 - 6}{-2 + 5} = -\frac{15}{3} = -5$$

$$m_2 = \frac{1 - \frac{1}{4}}{\frac{5}{4} - \frac{4}{4}} = \frac{\frac{3}{4}}{\frac{1}{4}} = 3; \text{ Line 1 is steeper.}$$

$$41. m_1 = \frac{-6 - 9}{-6 + 1} = \frac{-15}{-5} = 3$$

$$m_2 = \frac{-2 + 23}{0 + 7} = \frac{21}{7} = 3; \text{ parallel}$$

$$42. m_1 = \frac{1 + 3}{-8 - 4} = \frac{4}{-12} = -\frac{1}{3}$$

$$m_2 = \frac{20 - 11}{8 - 5} = \frac{9}{3} = 3; \text{ perpendicular}$$

$$43. m_1 = \frac{-7 - 3}{0 - 0} = \frac{-10}{0}; \text{ undefined}$$

$$m_2 = \frac{-4 + 4}{12 + 6} = \frac{0}{18} = 0; \text{ perpendicular}$$

$$44. m_1 = \frac{15 - 10}{5 - 1} = \frac{5}{4}$$

$$m_2 = \frac{2 - \frac{3}{2}}{4 - \frac{3}{2}} = \frac{\frac{1}{2}}{\frac{5}{2}} = \frac{1}{5}; \text{ neither}$$

$$45. m = \frac{27 - 3}{8 - 4} = \frac{24}{4} = 6; \frac{\text{dollars}}{\text{h}}$$

$$46. m = \frac{17 - 5}{3 - 0} = \frac{12}{3} = 4; \frac{\text{m}}{\text{sec}}$$

$$47. m = \frac{16 - 10}{4 - 2} = \frac{6}{2} = 3; \frac{\text{in.}}{\text{year}}$$

$$48. m = \frac{3 - 0}{1000 - 0} = 0.003 \quad 49. m = \frac{55.9}{5.2} = 10.75$$

50. Yes; each slanted half of the roof rises 12 feet of its 36 feet of the apartment building's width, which gives it a slope of  $\frac{12}{36} = \frac{1}{3}$ , the same as the  $\frac{4}{12}$  required by the building code.

51.  $\frac{3100 \text{ ft}}{50,000 \text{ years}} = 0.062 \text{ ft/year}$ ; This is the ratio of the number of vertical feet the volcano must grow to the length of time it will take to grow that high.

$$52. \frac{81^\circ\text{F} - 47^\circ\text{F}}{1 - 6} = \frac{34^\circ\text{F}}{17 \text{ hr}} = \frac{2^\circ\text{F}}{\text{h}}$$

$$81^\circ - 8 \text{ hr} \left( \frac{2^\circ}{\text{hr}} \right) = 81^\circ - 16^\circ = 65^\circ\text{F}$$

53. No; no; the only possible difference is the ease of calculation with the same selections over others. Check lines and points. A good response will show calculations for at least 4 pairs of points.

54. a. 18 ft

$$\text{b. } \sqrt{(18)^2 + (1.5)^2} = \sqrt{324 + 2.25} = \sqrt{326.25} \approx 18.1 \text{ ft}$$

$$\text{c. } \sqrt{(30)^2 + \left(\frac{5}{3}\right)^2} \approx 30 \text{ ft}$$

d. *Sample answer:* The steeper the ramp, the shorter it will be. If regulation requires more run for the amount of rise, the ramp must get longer as it did from answers (b) to (c) above.

$$55. \frac{7 - k}{k - 5} = 1$$

$$k - 5 = 7 - k$$

$$2k = 12$$

$$k = 6$$

$$56. \frac{6 - 2k}{k + 3} = 4$$

$$4k + 12 = 6 - 2k$$

$$6k = -6$$

$$k = -1$$

$$57. \frac{4 - k}{k + 2} = 3$$

$$3k + 6 = 4 - k$$

$$4k = -2$$

$$k = -\frac{1}{2}$$

$$58. \frac{-1 + k}{3k - 9} = -\frac{1}{3}$$

$$-3k + 9 = -3 + 3k$$

$$-6k = -12$$

$$k = 2$$

### 2.2 Mixed Review (p. 81)

59. additive inverse property 60. associative property of addition 61. distributive property 62. multiplicative inverse property

## Chapter 2 continued

63.  $8x + y = 15$   
 $y = 15 - 8x$
64.  $-2x - y = 11$   
 $-2x - 11 = y$
65.  $\frac{8}{3}x + 2y = 16$   
 $2y = 16 - \frac{8}{3}x$   
 $y = 8 - \frac{4}{3}x$
66.  $-6y + \frac{4}{5}x = 10$   
 $-6y = 10 - \frac{4}{5}x$   
 $y = -\frac{5}{3} + \frac{2}{15}x$
67.  $|9 + 2x| = 7$   
 $9 + 2x = -7$  or  $9 + 2x = 7$   
 $2x = -16$  or  $2x = -2$   
 $x = -8$  or  $x = -1$
68.  $|4 - 6x| = 2$   
 $4 - 6x = 2$  or  $4 - 6x = -2$   
 $-6x = -2$  or  $-6x = -6$   
 $x = \frac{1}{3}$  or  $x = 1$
69.  $|-3x + 1| = 4$   
 $-3x + 1 = 4$  or  $-3x + 1 = -4$   
 $-3x = 3$  or  $-3x = -5$   
 $x = -1$  or  $x = \frac{5}{3}$
70.  $|0.25x - 9| = 6$   
 $0.25x - 9 = 6$  or  $0.25x - 9 = -6$   
 $0.25x = 15$  or  $0.25x = 3$   
 $x = 60$  or  $x = 12$
71.  $\$5.82 = 9x + \$1.75$   
 $\$4.07 = 9x$   
 $\$0.45 \approx x$   
 about  $\$0.45/\text{oz}$

### Lesson 2.3

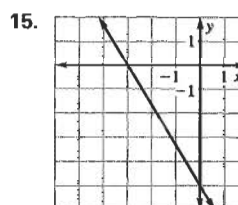
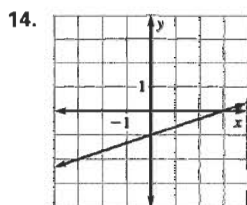
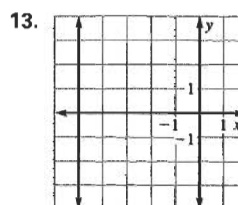
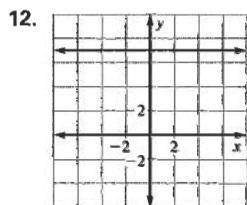
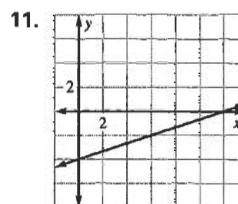
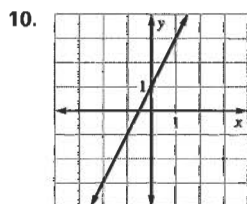
#### Developing Concepts Activity (p. 82)

Equation	Points on graph of equation	Slope	y-intercept
$y = 2x + 3$	(0, 3), (1, 5)	2	3
$y = -x + 2$	(0, 2), (1, 1)	-1	2
$y = \frac{1}{2}x - 4$	(0, -4), (1, -3 $\frac{1}{2}$ )	$\frac{1}{2}$	-4
$y = -2x$	(0, 0), (1, -2)	-2	0
$y = 7$	(0, 7), (1, 7)	0	7

2. The coefficient of  $x$  is the slope of its graph.
3. The constant term of the equation is the  $y$ -intercept of its graph.

### 2.3 Guided Practice (p. 86)

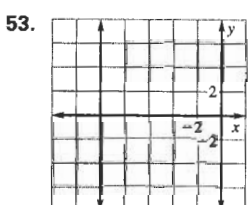
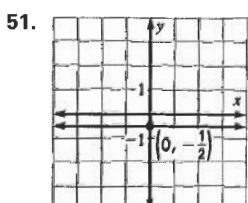
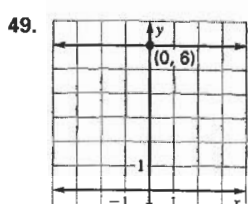
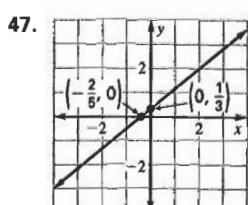
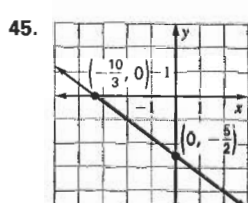
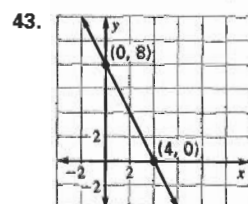
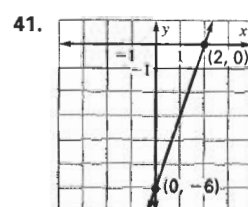
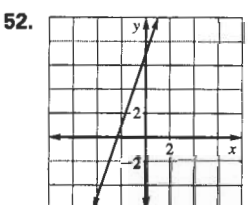
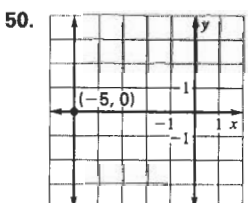
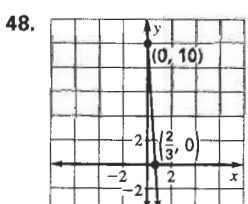
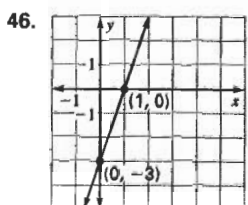
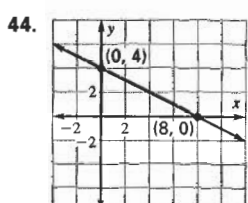
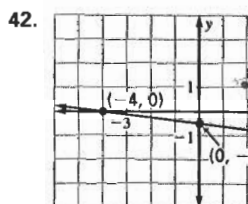
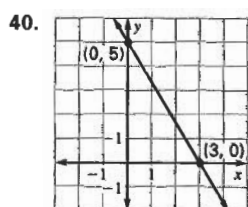
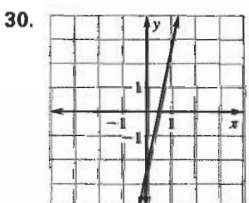
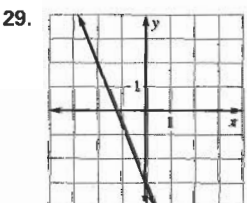
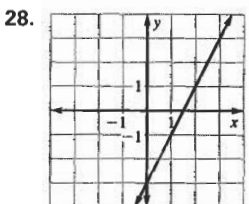
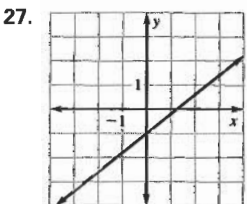
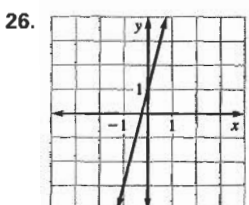
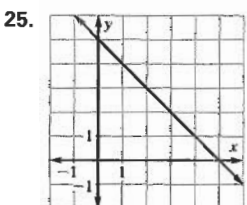
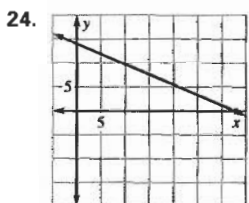
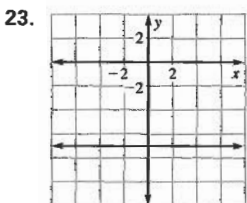
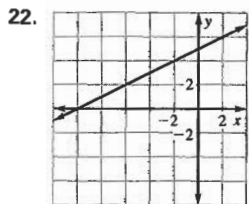
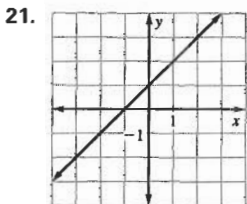
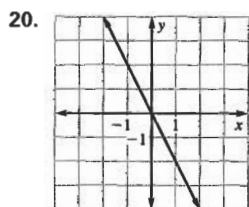
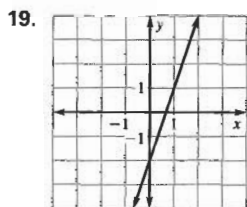
- The slope-intercept form of the equation is  $y = mx + b$ , where  $m$  is the slope and  $b$  is the  $y$ -intercept of the graph of the line. The standard form of the equation of a line is  $Ax + By = C$ .
- Slope-intercept technique; the equation is in slope-intercept form.
- Standard form technique; the equation is in standard form and the intercepts are easily found.
- $m = 1; b = 10$     5.  $m = -2; b = -7$
- $2x - 3y = 18$      $\frac{2}{3}; -6$   
 $-3y = 18 - 2x$   
 $y = \frac{2}{3}x - 6$
- $x$ -intercept = 11  
 $y$ -intercept = -11
- $5x = 20$      $-2y = 20$   
 $x$ -intercept = 4     $y$ -intercept = -10
- $x$ -intercept = 3  
 $y$ -intercept = -15



### 2.3 Practice and Applications (pp. 86-88)

16. B    17. A    18. C

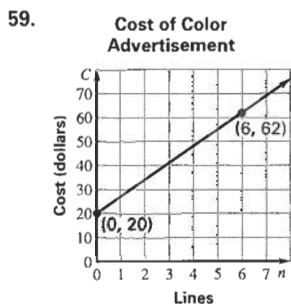
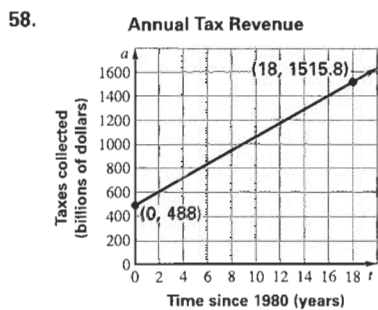
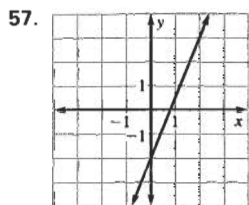
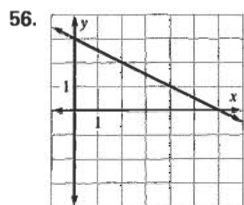
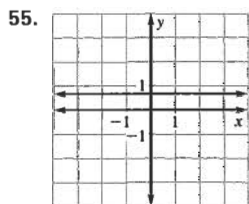
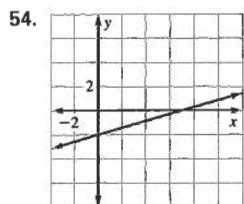
# Chapter 2 continued



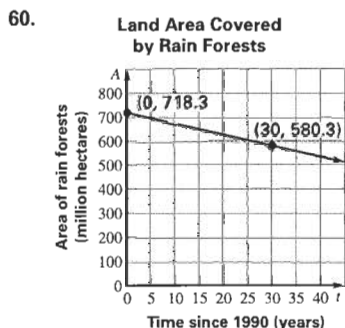
31.  $m = 6; b = 10$  32.  $m = -9; b = 0$   
 33.  $m = 0; b = 100$  34.  $m = -2; b = 14$   
 35.  $m = 4; b = -7$  36.  $m = -\frac{1}{10}; b = \frac{7}{10}$   
 37. B 38. C 39. A



# Chapter 2 continued

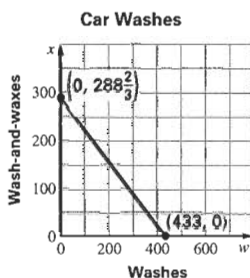


The slope, 7, represents the price of each line in the ad, while the  $C$ -intercept, 20, represents the initial cost of placing the colored ad.

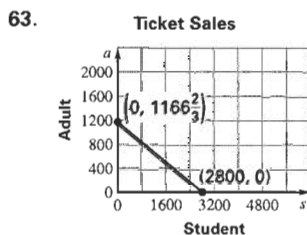
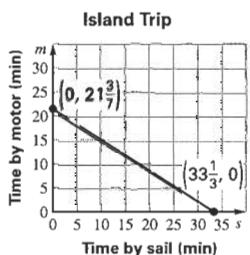


Sample answer: 672.3 million hectares in 2000; 557.3 million hectares in 2025; 442.3 million hectares in 2050

61.  $8w + 12x = 3464$



62.  $\frac{3}{20}s + \frac{7}{30}m = 5$



$2.5s + 6a = 7000$ ;  
Sample answer: 1600 student tickets, 500 adult; 880 student, 800 adult; 1000 student, 1000 adult.

64. To find the  $x$ -intercept, set  $y$  equal to zero in the equation, and solve for  $x$ . To find the  $y$ -intercept, set  $x$  equal to zero and solve for  $y$ . horizontal; vertical

65. B 66. B

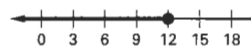
67.  $y_1 = 7x_1 + 6$

$y_2 = 7x_2 + 6$

$$\frac{(7x_2 + 6) - (7x_1 + 6)}{x_2 - x_1} = \frac{7x_2 - 7x_1}{x_2 - x_1} = \frac{7(x_2 - x_1)}{x_2 - x_1} = 7$$

### 2.3 Mixed Review (p. 88)

68.  $9 + x \leq 21$



$x \leq 12$

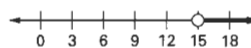
69.  $-\frac{2}{3}x + 3 < 11$



$-\frac{2}{3}x < 8$

$x > -12$

70.  $2x - 11 > 34 - x$



$3x > 45$

$x > 15$

71.  $64 - 3x \geq 19 - 2x$



$45 \geq x$

## Chapter 2 continued

72.  $-5 < 2x - 0.5 \leq 23$

$-4.5 < 2x \leq 23.5$

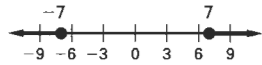
$-2.25 < x \leq 11.75$



73.  $x + 12 \leq 5$  or  $3x - 21 \geq 0$

$x \leq -7$  or  $3x \geq 21$

$x \geq 7$



74.  $f(8) = \frac{1}{2}(8) - 13 = -9$

75.  $f(5) = (5)^2 - 3(5) + 2 = 12$

76.  $f(-7) = -(-7)^3 + 8(-7)^2 + 3 = 738$

77.  $f(1) = 10 - 2(1) = 8$     78.  $f(-5) = |-5 + 17| = 12$

79.  $f(\frac{1}{2}) = 12(\frac{1}{2})^2 - 19 = -16$     80.  $m = \frac{2 - 2}{7 - 3} = \frac{0}{4} = 0$

81.  $m = \frac{9 + 3}{2 - 16} = \frac{12}{-14} = -\frac{6}{7}$     82.  $m = \frac{-8 + 9}{1 + 12} = \frac{1}{13}$

83.  $m = \frac{-5 + 1}{-1 + 1} = \frac{-4}{0}$ ; undefined

84.  $m = \frac{2 + 2}{-3 - 5} = \frac{4}{-8} = -\frac{1}{2}$

85.  $m = \frac{-5 - 7}{2 + 4} = \frac{-12}{6} = -2$

86.  $\frac{2 \text{ pages}}{1 \text{ minute}} \cdot \frac{60 \text{ minutes}}{1 \text{ hour}} = \frac{120 \text{ pages}}{1 \text{ hour}}$

Let  $T$  = the total number of pages read in  $h$  hours.

$T = 120h$

$1048 = 120h$

$h = 8\frac{11}{15} = 8 \text{ hours } 44 \text{ minutes}$

### Quiz 1 (page 89)

1. domain:  $-2, -1, 0, 1, 2$

range:  $-2, 1$

function

2. domain:  $1, 2, 3, 4$

range:  $1, 2, 3, 4$

not a function

3. domain:  $-3, -1, 0, 1, 2$

range:  $-3, -2, 0, 1$

function

4.  $f(4) = -2(4) - 13 = -21$

5.  $f(-5) = 5(-5)^2 - (-5) + 9 = 139$

6.  $m_1 = \frac{5 - 10}{1 - 2} = \frac{-5}{-1} = 5$

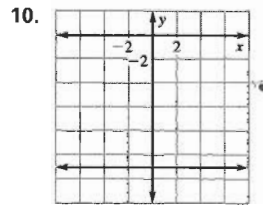
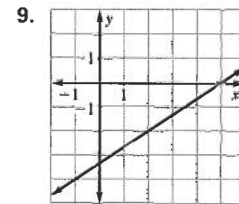
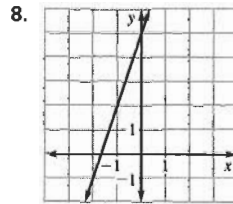
7.  $m_1 = \frac{2 - 5}{-9 - 4} = \frac{-7}{-13} = \frac{7}{13}$

$m_2 = \frac{-8 + 7}{8 - 3} = \frac{-1}{5} = -\frac{1}{5}$

$m_2 = \frac{-1 + 6}{-2 - 6} = \frac{5}{-8} = -\frac{5}{8}$

perpendicular

neither



11.  $\frac{468 \text{ mi}}{7 \times (5 \text{ P.M.} - 8 \text{ A.M.} - 1 \text{ h})} = \frac{468 \text{ mi}}{7 \times 8 \text{ h}} = \frac{468 \text{ mi}}{56 \text{ h}} \approx 8.36 \text{ mi/h}$

### Math and History (p. 89)

1.  $3 \text{ day} + 9\frac{2}{3} \text{ h} = 72 + 9\frac{2}{3} = 81\frac{2}{3} \text{ h}$

2.  $\frac{2100}{81\frac{2}{3} \text{ h}} \approx 25.7 \text{ mi/h}$

3.  $d = 3400 - 25.7t$

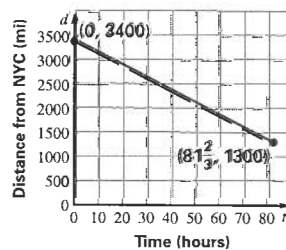
$d$  = distance in miles

$t$  = time in hours

domain:  $0 \leq t \leq 81.7$

range:  $1300 \leq d \leq 3400$

4. **Titanic Voyage**



### Technology Activity 2.3 (p. 90)

