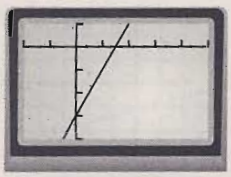
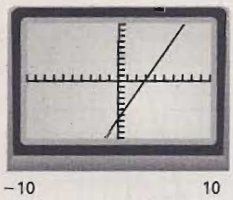
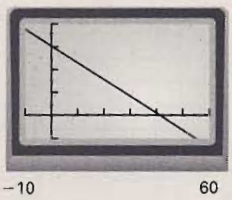
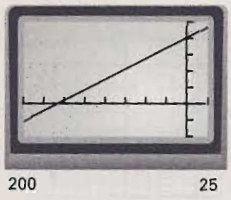
5. 

6. 

7. 

8. 

Lesson 2.4

2.4 Guided Practice (p. 95)

1. The constant of variation is the common value of $\frac{y}{x}$ when x and y show direct variation.

2. Given the slope, m, and the y-intercept, b, use the equation $y = mx + b$. Given the slope, m, and a point on the line, (x_1, y_1), use the equation $y - y_1 = m(x - x_1)$. Given two points on the line, use the points to find the slope of the line and then use the slope and one of the points to find the equation, as above.

3. *Sample answer:* the cost of a bag of apples and the weight of the fruit in the bag

4. $y = \frac{2}{5}x + 2$

5. $y + 4 = 2(x - 0)$
$y = 2x - 4$

6. $y - 2 = -3(x - 5)$
$y = -3x + 17$

7. $y - 0 = -\frac{3}{4}(x + 7)$
$y = -\frac{3}{4}x - \frac{21}{4}$

8. $m = \frac{8 - 2}{4 - 1} = \frac{6}{3} = 2$
$y - 8 = 2(x - 4)$
$y = 2x$

9. $m = \frac{0 - 2}{-5 - 0} = \frac{2}{5}$
$y - 0 = \frac{2}{5}(x + 5)$
$y = \frac{2}{5}x + 2$

10. $m_1 = 3$, perpendicular $m_2 = -\frac{1}{3}$
$y + 6 = -\frac{1}{3}(x - 1)$
$y = -\frac{1}{3}x - \frac{17}{3}$

11. $m = 5$
$y - 9 = 5(x - 3)$
$y = 5x - 6$

12. $c = 1.25p$
$c = 1.25(5)$
$c = 6.25$ million cassettes

2.4 Practice and Applications (pp. 95–98)

13. $y = 5x - 3$ **14.** $y = -3x - 4$ **15.** $y = -4x$

16. $y = 4$ **17.** $y = \frac{3}{5}x + 6$ **18.** $y = -\frac{3}{4}x + \frac{7}{3}$

19. $y - 4 = 2(x - 0)$
$y = 2x + 4$

20. $y - 0 = 3(x - 1)$
$y = 3x - 3$

21. $y - 5 = 0(x + 6)$
$y = 5$

22. $y - 3 = -\frac{2}{3}(x - 9)$
$y - 3 = -\frac{2}{3}x + 6$
$y = -\frac{2}{3}x + 9$

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

24. $y + 4 = \frac{2}{5}(x - 7)$
$y + 4 = \frac{2}{5}x - \frac{14}{5}$
$y = \frac{2}{5}x - \frac{34}{5}$

25. $m = 2$
$y + 1 = 2(x - 1)$
$y = 2x - 3$

26. $m_1 = \frac{-4 + 6}{3 - 4} = \frac{2}{-1} = -2$
$m_2 = \frac{1}{2}$
$y + 10 = \frac{1}{2}(x - 6)$
$y + 10 = \frac{1}{2}x - 3$
$y = \frac{1}{2}x - 13$

27. The slope needs to be undefined which means the line is horizontal; therefore $x = 2$.

28. $m_1 = \frac{4 + 6}{-10 - 6} = \frac{2}{4} = \frac{1}{2}$
$y - 6 = \frac{1}{2}(x - 4)$
$y = \frac{1}{2}x + 4$

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

30. $y - 8 = \frac{8 - 4}{-4 + 6}(x + 4)$
$y - 8 = \frac{4}{2}(x + 4)$
$y = 2x + 16$

31. $y + 5 = \frac{-15 + 5}{15 + 5}(x + 5)$
$y + 5 = -\frac{10}{20}(x + 5)$
$y + 5 = -\frac{1}{2}(x + 5)$
$y = -\frac{1}{2}x - \frac{15}{2}$

32. $y + 6 = \frac{-6 + 18}{-9 + 12}(x + 9)$
$y + 6 = \frac{12}{3}(x + 9)$
$y + 6 = 4x + 36$
$y = 4x + 30$

33. $y - 6 = \frac{6 - 2}{2 - 6}(x - 2)$
$y - 6 = -1(x - 2)$
$y = -x + 8$

34. $y - 0 = \frac{0-3}{0+1}(x-0)$

$y = -3x$

35. $y - 5 = \frac{5-14}{8-11}(x-8)$

$y - 5 = \frac{-9}{-3}(x-8)$

$y - 5 = 3x - 24$

$y = 3x - 19$

36. $y - 9 = \frac{9-7}{-5+4}(x+5)$

$y - 9 = -2(x+5)$

$y - 9 = -2x - 10$

$y = -2x - 1$

37. $y - 1 = \frac{1-8}{0+8}(x-0)$

$y - 1 = -\frac{7}{8}x$

$y = -\frac{7}{8}x + 1$

38. $y - 0 = \frac{6-0}{-4-2}(x-2)$

$y = -3(x-2)$

$y = -3x + 6$

39. $y - 15 = \frac{15+10}{5+20}(x-5)$

$y - 15 = x - 5$

$y = x + 10$

40. $y - 0 = \frac{0-6}{-2-0}(x+2)$

$y = 3(x+2)$

$y = 3x + 6$

41. $3 = \left(-\frac{1}{2}\right)(2) + b$

$3 = -1 + b$

$b = 4$

The equation is $y = -\frac{1}{2}x + 4$, the same as in Example 2. The slope-intercept equation of a line is unique.

42. $y - 4 = 1(x-3)$

$m = \frac{-1-4}{-2-3} = \frac{-5}{-5} = 1$

$y = x + 1$

This is the same equation as in Example 4, since the slope-intercept equation of a line is unique.

43. $y = \frac{7}{2}x$

$y = \frac{7}{2}(8) = 28$

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

$y = -\frac{5}{2}(8) = -20$

45. $y = -3x$

$y = -3(8) = -24$

46. $y = \frac{1}{6}x$

$y = \frac{1}{6}(8) = \frac{4}{3}$

47. $y = \frac{1}{2}x$

$y = \frac{1}{2}(8) = 4$

48. $y = 2x$

$y = 2(8) = 16$

49. $y = \frac{1}{2}x$

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

$-10 = x$

50. $y = \frac{5}{3}x$

$-5 = \frac{5}{3}x$

$-3 = x$

51. $y = \frac{1}{5}x$

$-5 = \frac{1}{5}x$

$-25 = x$

52. $y = \frac{1}{50}x$

$-5 = \frac{1}{50}x$

$-250 = x$

53. $y = \frac{1}{2}x$

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

$-10 = x$

54. $y = -\frac{22}{3}x$

$-5 = -\frac{22}{3}x$

$\frac{15}{22} = x$

55. yes; $y = \frac{1}{2}x$

56. no

57. yes; $y = -x$

58. yes; $y = -2x$

59. $P = 60{,}300t + 2{,}842{,}200$

$P = 60{,}300(24) + 2{,}842{,}200$

$P = 4{,}289{,}400$

60. $a = 0.138(t - 386) + 201$

$a = 0.138(2243) + 201$

$a \approx \$510.53$

61. $s = 0.629t + 7.4$

$s = 0.629(22) + 7.4$

$s \approx \$21.2$ billion

62. $V = \frac{5}{9}C + 333$

$V = \frac{5}{9}(60) + 333$

$V = \frac{100}{3} + 333$

$V = 366\frac{1}{3}$ m/sec

63. $h = \frac{1}{7}l$

$(5.5) = \frac{1}{7}l$

$38.5 \text{ ft} = l$

64. $C = 3.65t$

$438 = 3.65t$

$120 \text{ min} = t$

$2 \text{ h} = t$

65. $r = \frac{1}{240}t$

$2.75 \text{ in.} = \frac{1 \text{ in.}}{240 \text{ sec}}t$

$660 \text{ sec} = t$

$11 \text{ min} = t$

66. $A = 3w$

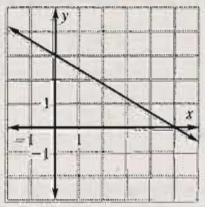
$A = 3(7.5 \text{ in.})$

$A = 22.5 \text{ in.}^2$

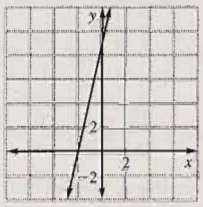
67. no

68. no

69. a.



b.



c. a is the x-intercept, b is the y-intercept.

d. $\frac{x}{3} + \frac{y}{4} = 1$

e. $\frac{x}{-5} + \frac{y}{-8} = 1$

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

70. $m = \frac{y-b}{x-0}$

$m = \frac{y-b}{x}$

$mx = y - b$

$y = mx + b$

2.4 Mixed Review (p. 98)

71. $|x - 10| = 17$

$x - 10 = -17$ or $x - 10 = 17$

$x = -7$ or $x = 27$

72. $|7 - 2x| = 5$

$7 - 2x = -5$ or $7 - 2x = 5$

$-2x = -12$ or $-2x = -2$

$x = 6$ or $x = 1$

73. $|-x - 9| = 1$

$-x - 9 = -1$ or $-x - 9 = 1$

$-x = 8$ or $-x = 10$

$x = -8$ or $x = -10$

74. $|4x + 1| = 0.5$

$4x + 1 = -0.5$ or $4x + 1 = 0.5$

$4x = -1.5$ or $4x = -\frac{1}{2}$

$x = -\frac{3}{8}$ or $x = -\frac{1}{8}$

75. $|22x + 6| = 9.2$

$22x + 6 = -9.2$ or $22x + 6 = 9.2$

$22x = -15\frac{1}{5}$ or $22x = 3\frac{1}{5}$

$x = -\frac{38}{55}$ or $x = \frac{8}{55}$

76. $|5.2x + 7| = 3.8$

$5.2x + 7 = -3.8$ or $5.2x + 7 = 3.8$

$5.2x = -10\frac{4}{5}$ or $5.2x = -\frac{16}{5}$

$x = \frac{-27}{13} \approx -2.08$ or $x = \frac{-8}{13} \approx -0.615$

77. $m = \dfrac{7 + 7}{2 - 1} = \dfrac{14}{1} = 14$ **78.** $m = \dfrac{-4 + 1}{-5 + 1} = \dfrac{-3}{-4} = \dfrac{3}{4}$

79. $m = \dfrac{10 - 4}{5 - 2} = \dfrac{6}{3} = 2$ **80.** $m = \dfrac{-1 + 2}{-3 - 5} = -\dfrac{1}{8}$

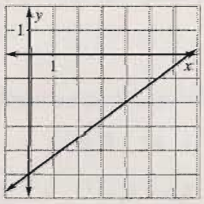
81. $m = \dfrac{4 - 4}{2 + 2} = \dfrac{0}{4} = 0$ **82.** $m = \dfrac{4 + 1}{-5 + 4} = \dfrac{3}{-9} = -\dfrac{1}{3}$

83. $m = \dfrac{10 + 8}{-9 + 0} = \dfrac{18}{-9} = -2$

84. $m = \dfrac{5 - 11}{-6 - 6} = -\dfrac{17}{0}$; undefined

85. $m = \dfrac{11 - 4}{-4 + 11} = \dfrac{7}{7} = 1$

86.



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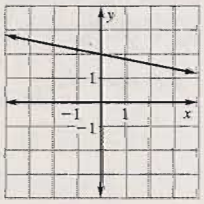

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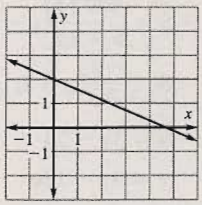

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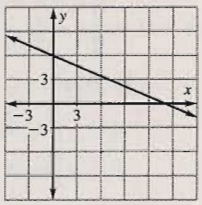

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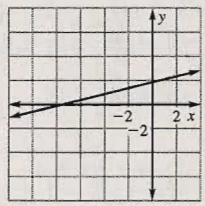

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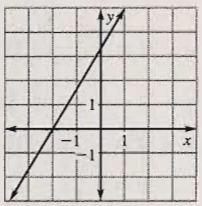

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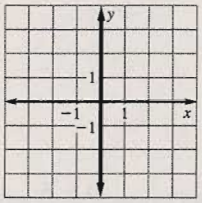

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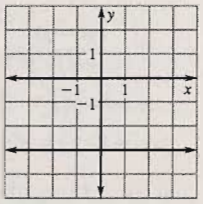

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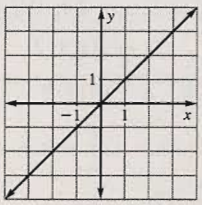


Developing Concepts Activity 2.5 (p. 99)

Good responses to the 4 steps and 6 exercises should include all of these:

- a complete table with 10 different data points
- an accurate scatter plot of the data
- a reasonable guess of the best-fitting line
- correct calculation of slope and y-intercept, with a correct equation
- correct use of model to predict y for $x = 300$ cm
- an actual measurement to check prediction

Lesson 2.5

2.5 Guided Practice (p. 103)

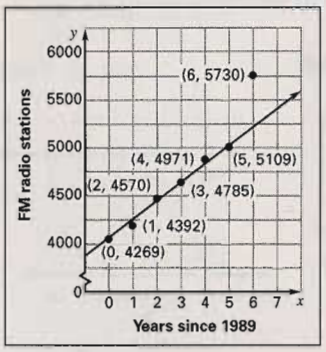
1. Positive correlation occurs if y-tends to increase as x-increases. A negative correlation occurs if y tends to decrease as x increases. Relatively no correlation occurs if the points show no linear pattern.
2. *Sample answer:* A positive correlation; taller men tend to have larger feet.
3. *Sample answer:* Two data points lie on the line and all the rest are above the line. There should be about as many data points below the line as there are above.

4. A positive correlation; the y-values tend to increase as the x-values increase.

5. $y = 0.25(4) + 0.375$

$y = 1.375$ m

6.



Sample answer:

Points (2, 4570) and (4, 4971)

$y - 4971 = \frac{4971 - 4570}{4 - 2}(x - 4)$

$y = 200.5x + 4169$

7. $y = 200.5(21) + 4169$

$y = 8379.5$

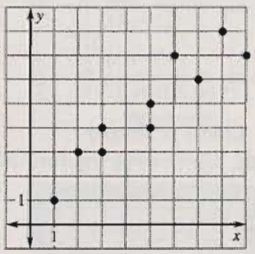
about 8380 stations

2.5 Practice and Applications (pp. 103–105)

8. negative correlation **9.** positive correlation

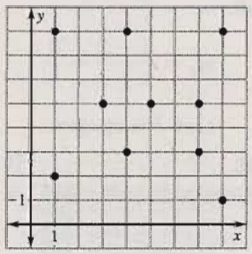
10. relatively no correlation

11.



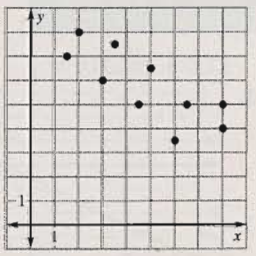
positive correlation

12.



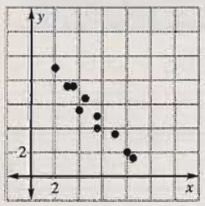
relatively no correlation

13.



negative correlation

14.

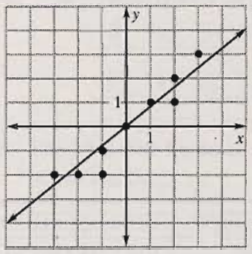


negative correlation

15. *Sample answer:* List the data points so that the values of x are in increasing order. If the y-values mostly increase along with the x-values, there is a positive correlation. If the y-values decrease as the x-values increase, there is a negative correlation. Otherwise, there is relatively no correlation.

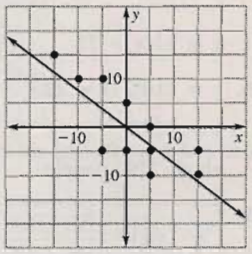
16–21 Sample answers are given.

16.



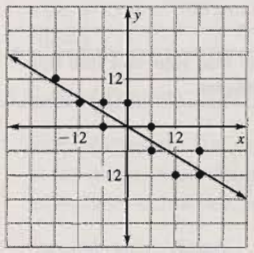
$y = 0.88x - 0.1$

17.



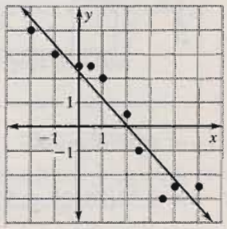
$y = -0.86x - 0.05$

18.



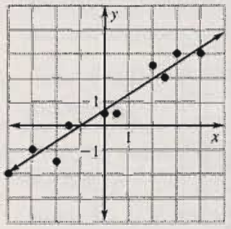
$y = -0.65x + 0.13$

19.



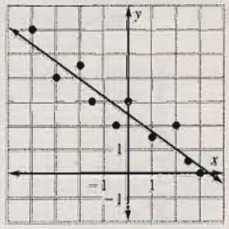
$y = -1.11x + 2.27$

20.



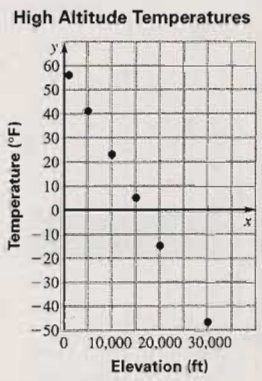
$y = 0.66x + 0.6$

21.



$y = -0.73x + 2.47$

22.

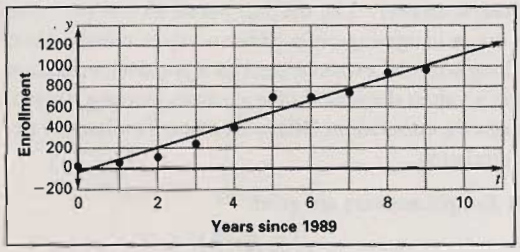


negative correlation

23.

positive correlation

24.



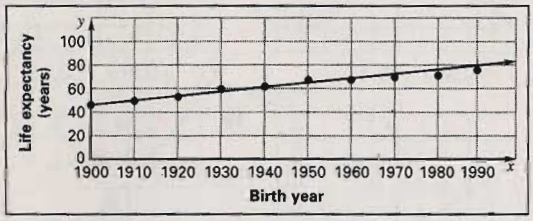
$y = 110t - 22$

25. $y = 110(21) - 22$

$y = 2288$

about 2290 people

26.



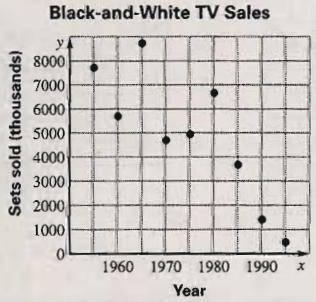
$y = 0.325x - 571$

27. $y = 0.33(2010) - 571$

$y = 92.3$

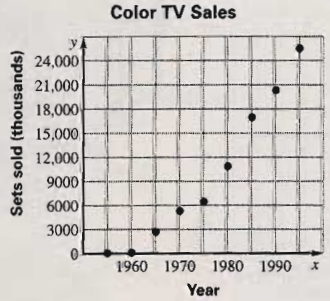
about 92 years

28. a.



negative correlation

b.



positive correlation

c. Negatively correlated; as sales of color TVs increased, the sales of black-and-white TVs decreased.

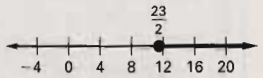
29. *Sample answer:* One possibility would be the way the price of a gallon of gas varies over time, since the fluctuations in the price are so erratic and cannot be predicted. Another possibility would be the sales of some new technology that showed up on the scene and then died out very quickly when it was replaced by something else.

2.5 Mixed Review (p. 106)

30. $2x - 9 \geq 14$

$2x \geq 23$

$x \geq \frac{23}{2}$

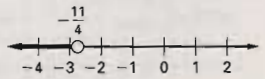


31. $3(x + 7) < -x + 10$

$3x + 21 < -x + 10$

$4x < -11$

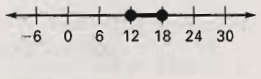
$x < -\frac{11}{4}$



32. $17 \leq 2x - 7 \leq 29$

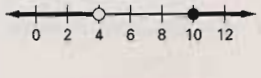
$24 \leq 2x \leq 36$

$12 \leq x \leq 18$



33. $x - 4 < 0$ or $x - 6 \geq 4$

$x < 4$ or $x \geq 10$



34. $m_1 = \frac{6 - 4}{1 + 3} = \frac{2}{4} = \frac{1}{2}$

$m_2 = \frac{2 + 5}{6 - 1} = \frac{7}{5}$;

Line 2 is steeper.

35. $m_1 = \frac{4 - 1}{-4 - 6} = -\frac{3}{10}$

$m_2 = \frac{-6 - 3}{1 + 2} = -\frac{9}{3} = -3$;

Line 2 is steeper.

36. $m_1 = \frac{4 - 7}{2 - 1} = -3$

$m_2 = \frac{8 - 8}{3 + 5} = \frac{0}{8}$;

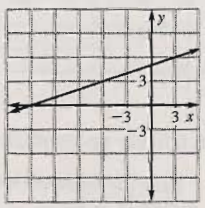
Line 1 is steeper.

37. $m_1 = \frac{-9 - 3}{1 - 4} = \frac{-12}{-3} = 4$

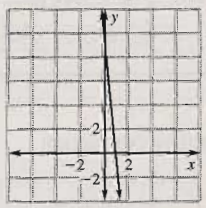
$m_2 = \frac{-7 + 4}{3 + 2} = -\frac{3}{5}$;

Line 1 is steeper.

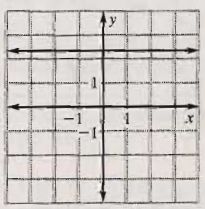
38.



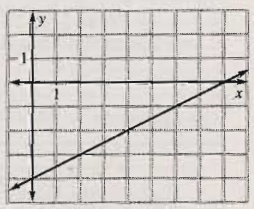
39.



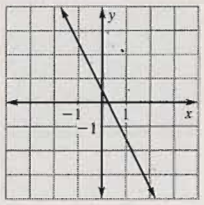
40.



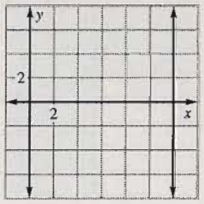
41.



42.



43.



Quiz 2 (p. 106)

1. $y - 6 = \frac{2}{3}(x - 0)$

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

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

2. $y + 3 = 2(x + 4)$

$y + 3 = 2x + 8$

$y = 2x + 5$

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

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

$y = -\frac{1}{5}x - \frac{33}{5}$

4. $m_1 = \frac{4 - 2}{0 - 4} = \frac{2}{-4} = -\frac{1}{2}$

$m_2 = 2$

$y + 2 = 2(x - 1)$

$y + 2 = 2x - 2$

$y = 2x - 4$

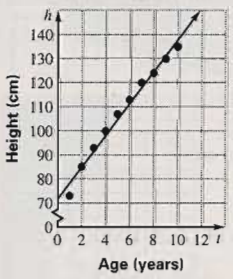
5. relatively no correlation **6.** negative correlation

7. positive correlation **8.** $d = 1.3h$

$5.2 = 1.3h$

$4 \text{ ft} = h$

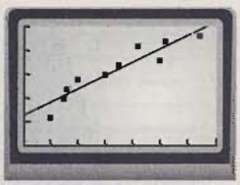
9.



$h = 6.63t + 71.5$

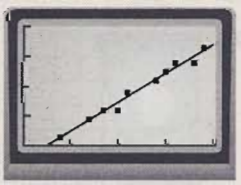
Technology Activity 2.5 (page 107)

1.



$y = 0.0028x + 0.32$

2.

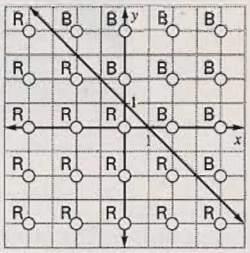


$y = 97.8x - 247.8$

Lesson 2.6

Activity (p. 108)

1. and 2.



3. The blue dots lie on or above the line; the red dots are below the line.

4. *Sample answer:* Graph the related line, solid if the inequality is ≤ or ≥ ; dashed if the inequality is < or >. Test a point not on the line to see if it is a solution of the inequality and find out which region of the plane to shade.

2.6 Guided Practice (p. 111)

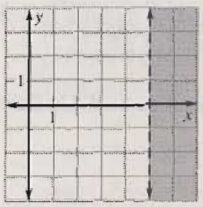
1. *Sample answer:* The graph of a linear equation is a line in the plane, while the graph of a linear inequality is a half-plane with a line as its boundary.

2. Dashed; solid; *Sample answer:* The points for which $Ax + By = C$ are solutions of the latter inequality and are included as part of the graph by using a solid line, but are not solutions of $Ax + By < C$.

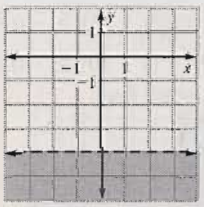
3. False; $(3)\left(\frac{4}{3}\right) - 0 = 4$, so $\left(\frac{4}{3}, 0\right)$ is not a solution of the inequality.

4. True; for points (x, y) on the line, $y = 3x + 5$. For points (x, y) below the line, the inequality is satisfied, since the y values are smaller.

5.

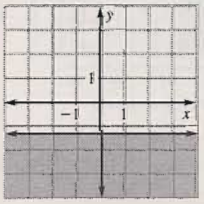


6.

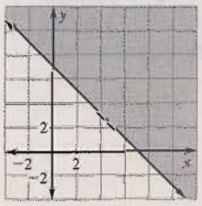


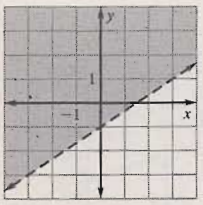
7.

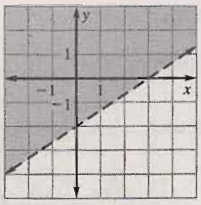
8.

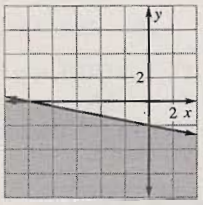


9.

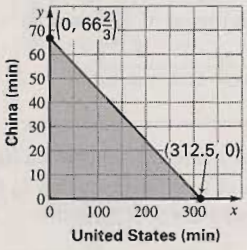


10. 

11. 

12. 

13.



One possible solution is to spend 50 minutes on calls to China and 78 minutes on calls in the United States, for a total cost of $49.98. Another solution would be to spend 50 minutes on calls within the United States and 56 minutes on calls to China; this uses exactly $50. A third solution is 100 minutes on calls within the United States and 45 minutes on calls to China. This solution uses a total of $49.75.

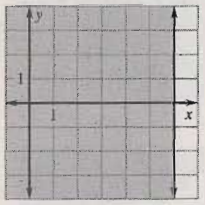
2.6 Practice and Applications (p. 111)

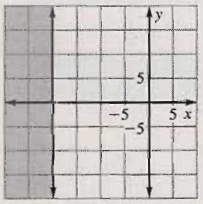
14. $0 \le -5$ no
$-5 \le -5$ yes

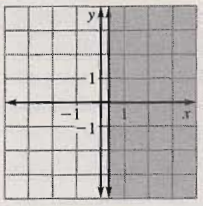
15. $2(-6) \ge 7$ no
$2(4) \ge 7$ yes

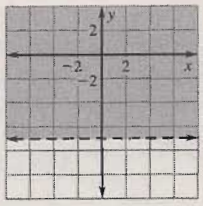
16. $2 < -9(-2) + 7$ yes
$-8 < -9(3) + 7$ no

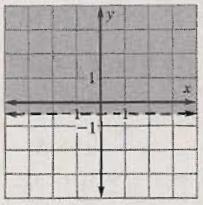
17. $19(2) + (3) \ge -0.5$ yes
$19(-1) + (0) \ge -0.5$ no

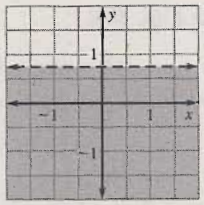
18. 

19. 

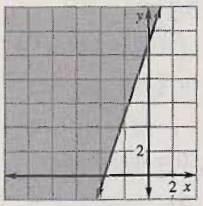
20. 

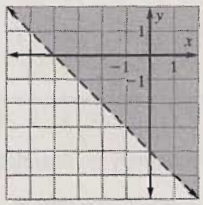
21. 

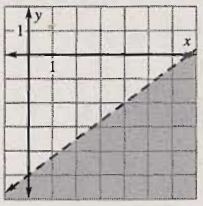
22. 

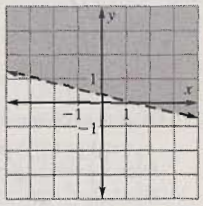
23. 

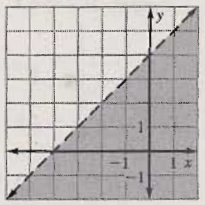
24. B **25.** C **26.** A

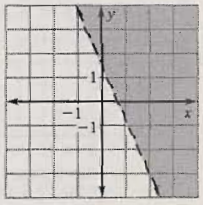
27. 

28. 

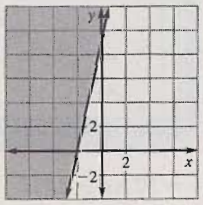
29. 

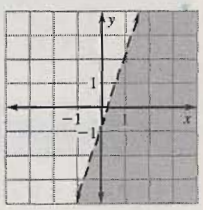
30. 

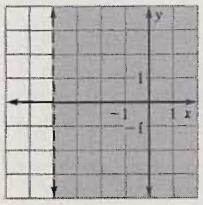
31. 

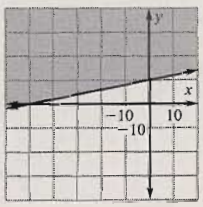
32. 

33. C **34.** A **35.** B

36. 

37. 

38. 

39. 

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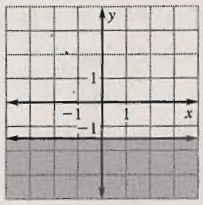
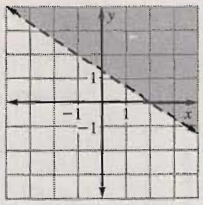
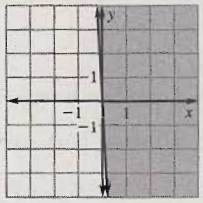


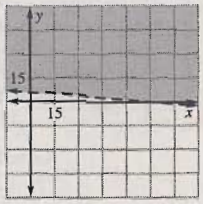
41.



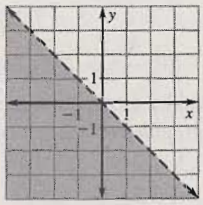
42.



43.

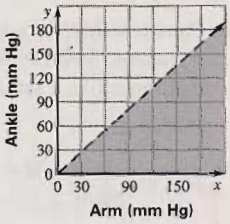


44.

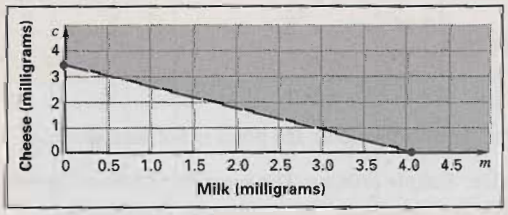


45. $y < 0.9x$

Blood Pressure Readings



46. $296m + 338c \geq 1200$



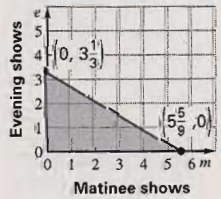
47. $296m + 338(2) \geq 1200$

$296m \geq 524$

$m \geq 1.77$ cups

48. $4.5m + 7.5e \leq 25$

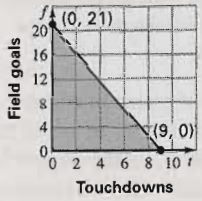
Movies



49. *Sample answer:* You can attend 5 matinees and no evening showings for a total of \$22.50, 2 of each for a total cost of \$24 or 3 evening showings at a cost of \$22.50.

50. $7t + 3f \leq 63$

Football Scoring

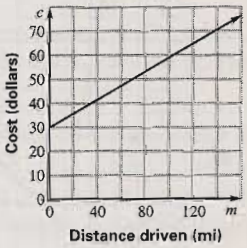


51. *Sample answer:*

9 touchdowns and no field goals for 63 points;
5 touchdowns and 1 field goal for 38 points;
2 touchdowns and 3 field goals for 23 points;
4 touchdowns and 11 field goals for 61 points;
6 touchdowns and 1 field goal for 45 points.

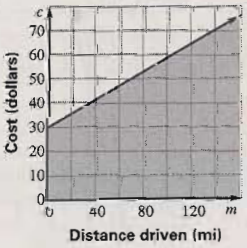
52. a. $c = 29.99 + 0.29m$

Truck Rental



b. $c = 29.99 + 0.29m$

Truck Rental

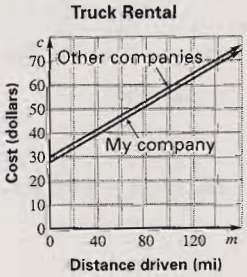


c. *Sample answer:* If I charge a lower flat rate and not the per mile charge, I will always be lower in price than my competitors with the same mile rate.

d. *Sample answer:*

$c = 27.77 + 0.29$ m

Truck Rental



e. *Sample answer*: If I raise my flat rate my total cost would be more expensive until both cars have gone a distance that would make my total cost lower.

53. $4x + 9y \leq 36$

54. *Sample answer:* I used the x and y intercepts to find two points on the line. From there I used the point-slope formula to find the equation of the line. Since the line is drawn in full and the area shaded is less than 36, the equation is written $4x + 9y \leq 36$.

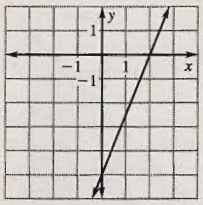
55. *Sample answer:* x is the number of grams of carbohydrates and protein and y is the number of grams of fat in a food that has 56 or fewer cal., or if x is the number of minutes spent walking at 4 mi/h and y is the number of minutes spent riding a bike at 9 mi/h, then $4x + 9y \leq 36$ represents those combinations of (x, y) that correspond to 36 or fewer miles.

2.6 Mixed Review (p. 113)

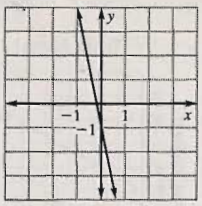
56. 1.0×10^7 **57.** 1.65×10^9 **58.** 2.03×10^5

59. 6.7×10^{-4} **60.** 9×10^{-7} **61.** 8.08×10^{-2}

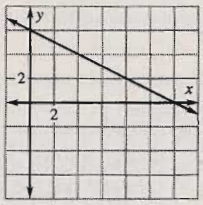
62.



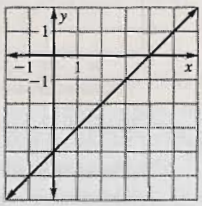
63.



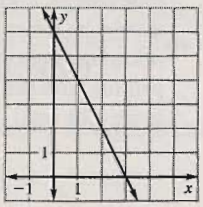
64.



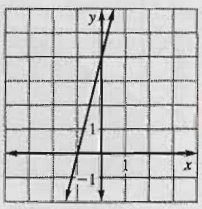
65.



66.



67.



68. $y - 2 = \frac{2-5}{2-5}(x - 2)$

$y - 2 = x - 2$

$y = x$

69. $y - 7 = \frac{7-1}{0-5}(x - 0)$

$y - 7 = -\frac{6}{5}x$

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

70. $y - 6 = \frac{6+2}{-1-8}(x + 1)$

$y - 6 = -\frac{8}{9}(x + 1)$

$y = -\frac{8}{9}x + \frac{46}{9}$

71. $y - 2 = \frac{-4-2}{3-3}(x - 3)$

$x = 3$

72. $y - 9 = \frac{9+6}{1+10}(x - 1)$

$y - 9 = \frac{15}{11}(x - 1)$

$y = \frac{15}{11}x + \frac{84}{11}$

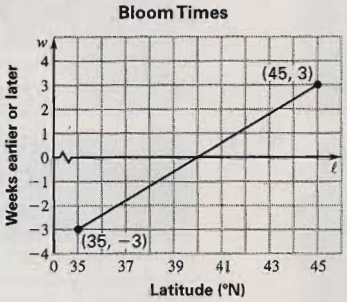
73. $y + 8 = \frac{-8+8}{-7-4}(x - 4)$

$y + 8 = 0$

$y = -8$

74. domain: $35 \leq l \leq 45$

range: $-3 \leq w \leq 3$



Lesson 2.7

2.7 Guided Practice (p. 117)

1. Piecewise functions are represented by a combination of equations. Step functions have a graphic representation that looks like a set of steps;

Piecewise:

$$f(x) = \begin{cases} 2x - 1, \text{if } x \leq 1 \\ 3x + 1, \text{if } x > 1 \end{cases}$$

Step function:

$$f(x) = \begin{cases} 1, \text{if } 0 \leq x < 1 \\ 2, \text{if } 1 \leq x < 2 \\ 3, \text{if } 2 \leq x < 3 \\ 4, \text{if } 3 \leq x < 4 \end{cases}$$

2. The point is included; the point is not included.

3. False; *Sample answer:* The separate pieces are graphs of different functions. The graphs don't have to be connected. For example, a step function is a piecewise function, but the steps of its graph are not connected.

4. True; in substituting $x = 1, 2, 3$ into the greatest integer function, the graphical representation is the same as the earlier step function.

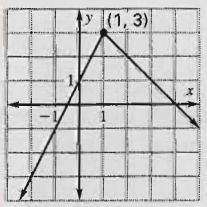
5. $f(10) = 2x + 7 = 20 + 7 = 27$

6. $f(-\frac{1}{3}) = 3(-\frac{1}{3}) - 1 = -1 - 1 = -2$

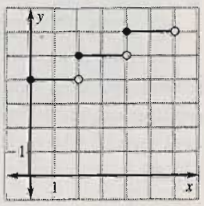
7. $f(4) = 3(4) - 1 = 12 - 1 = 11$

8. $f(-2) = 3(-2) - 1 = -6 - 1 = -7$

9.



10.



11. $f(x) = \begin{cases} -\frac{4}{3}x + 6, \text{if } 0 \leq x < 3 \\ -\frac{2}{5}x + \frac{16}{5}, \text{if } 3 \leq x \leq 8 \end{cases}$