

Selected Answers

Chapter 4

4.1 Skill Practice 1. slope 3. $y = 2x + 9$
5. $y = -3x$ 7. $y = \frac{2}{3}x - 9$ 11. $y = -\frac{1}{2}x$ 13. $y = \frac{2}{3}x - 8$

15. $y = -2x - 2$ 17. The slope should be $\frac{0-4}{5-0}$,

$y = -\frac{4}{5}x + 4$. 19. $y = 4x + 4$ 21. $y = -\frac{4}{3}x$

23. $y = 2x - 2$ 25. $y = -x - 5$ 27. $y = -0.0625x + 4$

29. $y = -4x - 24$ 31. $y = -2x + 7$ 33. $y = -\frac{4}{5}x - 1$

35. $y = \frac{2}{3}x + 3$ 37. $y = -3x + 9$ 39. m changed from 2 to $-\frac{1}{3}$, and b changed from -1 to 1.

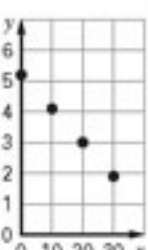
41. $y = -2x + 1$ 43. No; the slope of the line is undefined, the equation is $x = 3$, which is not in slope-intercept form.

4.1 Problem Solving 45. a. $C = 44m + 48$

b. \$312 47. $C = 3h + 30$; \$42

49. a.

x (years since 1970)	y (km ²)
0	5.2
10	4.1
20	3.0
30	1.9

b.  The area of the glaciers changed -1.1 square kilometers between every 10 year interval. c. $y = -0.11x + 5.2$; -0.11 km^2

51. a. $t = 0.7d + 2$ b. 16 min

4.1 Graphing Calculator Activity

1. $y = -2x + 5$ 3. $y = 2x + 1.5$ 5. $y = 1.5x + 2$
7. $y = 4x - 3$ 9. $y = 0.5x + 1$; substitute 2 for x , 2 for y , and solve for b .

4.2 Skill Practice

1. y -intercept
3. $y = 3x - 2$ 5. $y = -5x - 13$ 7. $y = -\frac{3}{4}x + 2$

9. -3 was substituted for x instead of y and 6 was substituted for y instead of x , $-3 = -2(6) + b$, $-3 = -12 + b$, $9 = b$. 11. $y = 3x + 1$ 13. $y = -\frac{2}{5}x - 1$

15. $y = -\frac{3}{4}x + \frac{35}{8}$ 17. $y = 4x - 15$ 19. $y = -\frac{1}{2}x + \frac{1}{2}$

21. $y = \frac{1}{3}x - \frac{4}{3}$ 23. $y = -2x + 11$ 25. $y = -\frac{1}{2}x + 8$

27. $y = x - 2$ 31. $y = -\frac{2}{3}x + 6$ 33. $y = 6x - 4$

35. Yes; you can substitute m and the coordinates of the point in $y = mx + b$, solve for b , and write the

equation. 37. Yes; you can find the slope of the line, then substitute the y -intercept for b , and write the equation. 39. $y = \frac{9}{2}x - \frac{1}{2}$ 41. The lines $y = \frac{3}{2}x - \frac{1}{2}$ and $y = \frac{9}{2}x - \frac{1}{2}$ and the lines $y = \frac{9}{2}x - \frac{1}{2}$ and $y = \frac{3}{2}x + \frac{11}{2}$ intersect because they have different slopes; the lines $y = \frac{3}{2}x - \frac{1}{2}$ and $y = \frac{3}{2}x + \frac{11}{2}$ will not intersect because they have the same slope, so they are parallel.

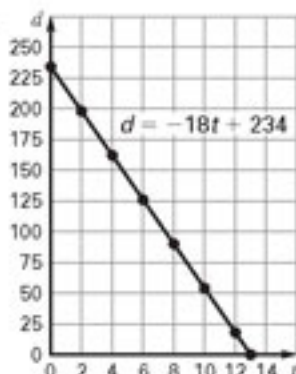
43. The three points do not lie on the same line. If you find the equation of the line between two of the points and then check to see that the third point is a solution, you can see they do not lie on the same line.

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4.2 Problem Solving 47. $\frac{3}{4}$ ft/yr; 6 ft 49. 115 min or

1 h 55 min; substitute 30 for m , 2 for x , and 85 for y into the equation $y = mx + b$ to find $b = 25$. Then substitute 3 for x into the equation $y = 30x + 25$ to solve for y . 51. a. about 584 newspapers b. $y = 11.8x + 584$ c. about 938 newspapers

53. a. $d = -18t + 234$

b.  The slope is the rate that the hurricane is traveling, the y -intercept represents the distance from the town at 12 P.M.

c. 1 A.M.; find the t -intercept to find the value of t when the distance to the town is 0; substitute 0 for d and solve for t ; $t = 13$, so you need to add 13 hours to 12 P.M. to get 1 A.M.

4.2 Problem Solving Workshop 1. \$5; \$19

3. No; if the cost of the 60 inch bookshelf changes, the cost no longer increases at a constant rate. 5. The student assumes that there is no fixed fee by using a proportion; $93 - 57 = 36$, $36 \div 2 = 18$, $57 + 18 = 75$.

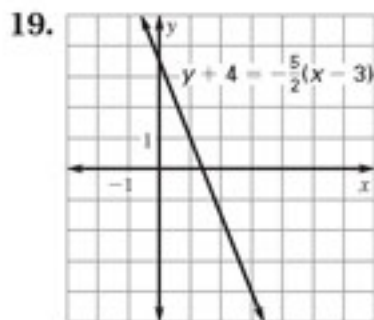
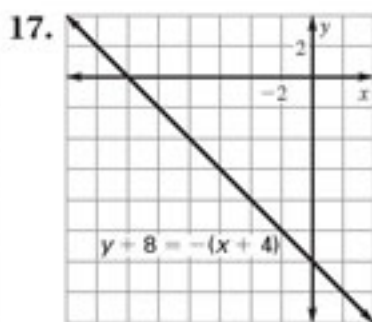
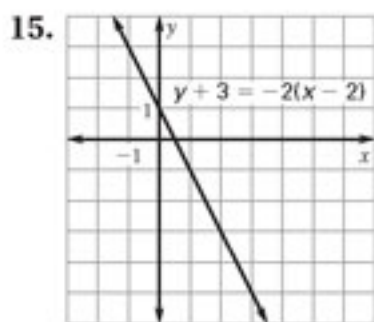
4.3 Skill Practice 1. -2 ; $(-5, 5)$ 3. $y - 1 = 2(x - 2)$

5. $y + 1 = -6(x - 7)$ 7. $y - 2 = 5(x + 8)$

9. $y + 3 = -9(x + 11)$ 11. $y + 12 = -\frac{2}{5}(x - 5)$

13. The form is $y - y_1$, so the left side should be $y - (-5)$ or $y + 5$; $y + 5 = -2(x - 1)$.

Selected Answers

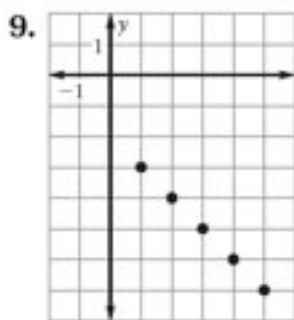
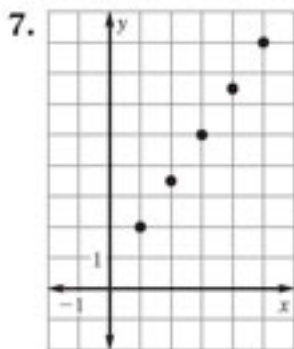
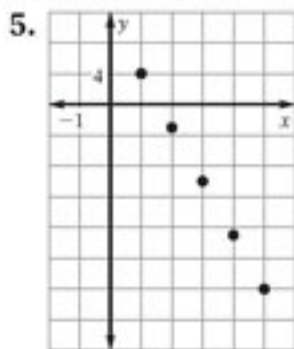


21. $y - 4 = (x - 1)$ or $y - 1 = (x + 2)$
 23. $y - 2 = -2(x - 7)$ or $y - 12 = -2(x - 2)$
 25. $y + 1 = -\frac{3}{5}(x + 4)$ or $y + 7 = -\frac{3}{5}(x - 6)$

27. $y + 20 = 8(x + 3)$ or $y - 36 = 8(x - 4)$
 29. A point was not substituted into the equation, the y -coordinates of the two points were substituted;
 $y - 2 = \frac{2}{3}(x - 1)$. 31. No; because the increase is not at a constant rate, the situation cannot be modeled by a linear equation. 33. No; because the increase is not at a constant rate, the situation cannot be modeled by a linear equation.

4.3 Problem Solving 37. a. $y = 130x + 530$
 b. \$1570 39. $y = 10000x + 67000$; \$127,000 41. a. Since the cost increases at a constant rate of \$.49 per print, the situation can be modeled by a linear equation.
 b. Sample answer: $y - 1.98 = 0.49(x - 1)$ c. \$1.49
 d. \$1.79 43. a. $y - 17.6 = -0.06(x - 60)$ b. 16.4 ft/sec

Extension 1. yes; 2, -1 3. yes; -43, -50



11. $a_n = 51 + (n - 1)21$; 2130 13. $a_n = \frac{1}{4} + (n - 1)\frac{1}{8}$;
 $12\frac{5}{8}$ 15. $a_n = 1 + (n - 1)\frac{1}{3}$; 34

4.4 Skill Practice 1. standard form 3. point-slope form 5-9. Sample answers are given.

5. $2x + 2y = -20$, $3x + 3y = -30$ 7. $x - 2y = -9$,
 $-2x + 4y = 18$ 9. $3x - y = -4$, $6x - 2y = -8$

11. $-x + y = 5$ 13. $2x + y = 5$ 15. $\frac{3}{2}x + y = -10$

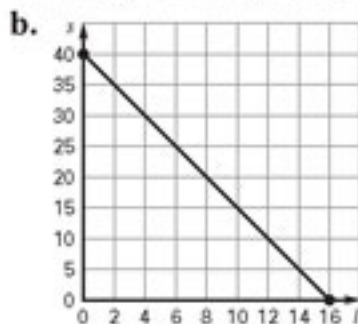
17. $\frac{2}{3}x + y = -\frac{4}{3}$ 19. $-\frac{4}{3}x + y = -1$ 21. $-\frac{1}{2}x + y = 1$

23. $y = 2$, $x = 3$ 25. $y = 3$, $x = -1$ 27. $y = 4$, $x = -1$

29. (1, -4) was substituted incorrectly, 1 should be substituted for x and -4 substituted for y , $A(1) - 3(-4) = 5$, $A + 12 = 5$, $A = -7$. 31. 4; $4x + 3y = 5$
 33. -4; $-x - 4y = 10$ 35. -5; $-5x - 3y = -5$

4.4 Problem Solving 39. a. 15 oz

b. $12c + 15w = 120$ c. 10 corn, 0 wheat; 5 corn, 4 wheat; 0 corn, 8 wheat 41. a. $100\ell + 40s = 1600$



c.

Large rafts	Small rafts
16	0
14	5
12	10
10	15
8	20
6	25
4	30
2	35
0	40

4.5 Skill Practice 1. perpendicular

3. $y = 2x + 5$ 5. $y = -\frac{3}{5}x + 2$ 7. $y = 6x + 1$

9. $y = 2x + 9$ 11. $y = 3x + 30$ 13. parallel: a and b ;
 perpendicular: none 15. parallel: none; perpendicular:
 a and b 17. The line through points (6, 4) and (4, 1)
 is perpendicular to the line through points (1, 3)
 and (4, 1); the slope of the line through the points
 (6, 4) and (4, 1) is $\frac{3}{2}$, the slope of the line through the
 points (1, 3) and (4, 1) is $-\frac{2}{3}$. The slopes are negative
 reciprocals, so the lines are perpendicular.

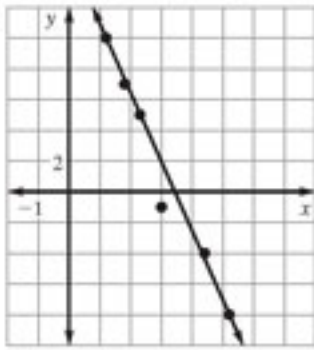
19. $y = -\frac{1}{3}x - 1$ 21. $y = -2x + 24$ 23. $y = -\frac{3}{4}x - 4$

25. $y = -\frac{1}{2}x - \frac{1}{2}$ 27. (2, 1) was substituted incorrectly,
 2 should be substituted for x , and 1 should be
 substituted for y ; $1 = 2(2) + b$, $1 = 4 + b$, $-3 = b$.

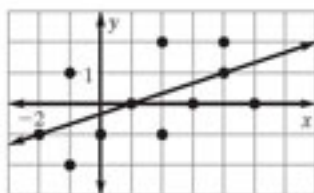
Selected Answers

4.5 Problem Solving 33. a. $w = 200d + 6000$; $w = 200d + 6250$ b. 12,000 lb; 12,250 lb
c. The graphs of the lines are parallel because they have the same slope, 200. The w -intercept of the second line is 250 more than the w -intercept of the first line. 35. Different registration fees; because the lines are parallel, the rate of change, the monthly fee, for each must be equal. Therefore, the students paid different registration fees.

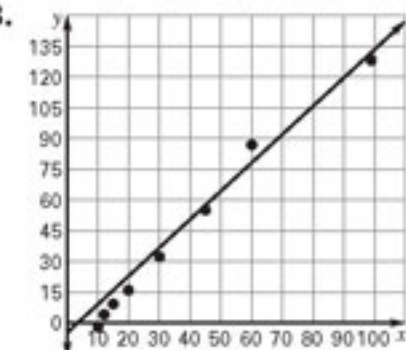
4.6 Skill Practice 1. increase 3. positive correlation 5. negative correlation

7.  *Sample answer:*
 $y = -4.5x + 15.4$

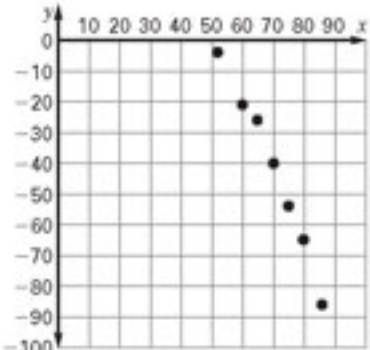
9. The line does not have approximately half the data above it and half below it.



11. *Sample answer:* The amount of time driving a car and the amount of gas left in the gas tank

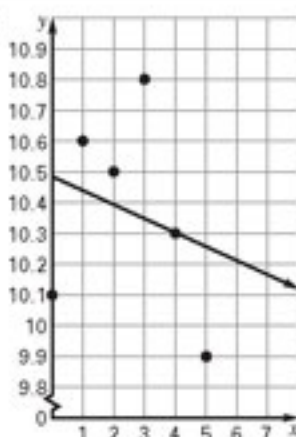
13.  Positive correlation.
Sample answer:
 $y = 1.49x - 13$

4.6 Problem Solving

17. a.  b. *Sample answer:*
 $y = -2.2x + 111$
c. *Sample answer:*
-2.2 degrees per kilometer

19. *Sample answer:* $y = 12.6x + 32$

4.6 Graphing Calculator Activity 1. See art in Exercise 3; negative correlation.

3.  5. *Sample answer:* You cannot use the best-fitting line to predict future sales because the data do not show a strong correlation.

Extension 1. about 0.927; The data show a strong positive correlation. While an increase in the number of minutes played may contribute to an increase in the number of points scored, there is not causation. The number of minutes played and the number of points scored may both be a result of the ability of the player. 3. *Sample answer:* I think that as music downloads increase, sales of CDs decrease, so I would expect a strong negative correlation. The increase in the number of music downloads causes the decline in CD sales as users find downloading a more convenient way to obtain music.

4.7 Skill Practice 1. linear interpolation

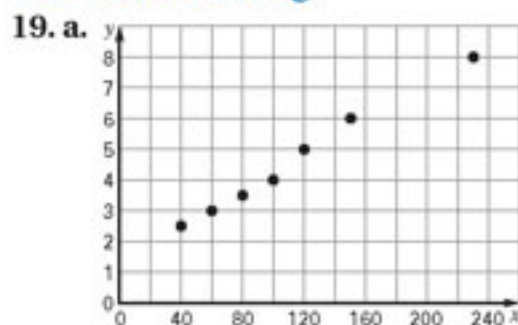
3.  $y = 2.6x + 2.3$; 15.3

5.  $y = 10.7x + 20$; 127

7. $2\frac{2}{3}$ 9. -16 11. 1.5 13. To find the zero of a function, substitute 0 for y , not x ; $0 = 2.3x - 2$, $2 = 2.3x$, $x = \frac{20}{23}$ 15. a and b were not substituted correctly; $y = 4.47x + 23.1$.

Selected Answers

4.7 Problem Solving



b. $y = 0.03x + 1.23$ c. about 8.73 ft^2

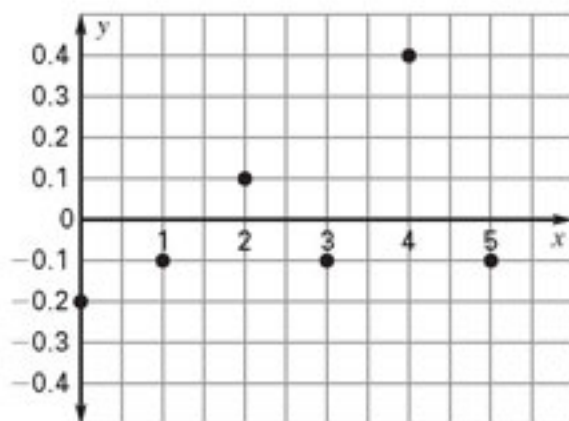
21. a. $y = -197.6x + 3542$ b. about 17.9; 17.9 years from 1985, or 2002, the number of people living in high noise areas will be 0; no.

4.7 Internet Activity

1. Answers may vary. 3. Answers may vary.

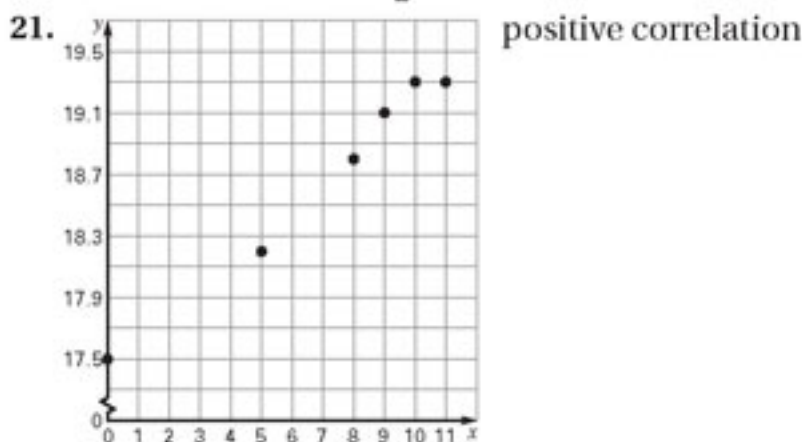
Extension 1. The residuals are consistently positive; this implies that the line is in the wrong place.

3. The distances between the points and the x -axis appear to be relatively small and the points are more or less evenly distributed above and below the x -axis. The linear model is a good fit. 5. The residuals are $-0.2, -0.1, 0.1, -0.1, 0.4,$ and -0.1 .



Chapter Review 1. negative 3. The zero of a function is the x -value of the function when $y = 0$; it is the x -intercept of the graph. 5. $y = \frac{4}{9}x + 5$
 7. $y = -1.25x + 25$; \$22.50 9. $y = x + 3$ 11. $y - 7 = -6(x - 4)$ or $y - 1 = -6(x - 5)$ 13. $y + 2 = -\frac{6}{11}(x + 3)$ or $y + 8 = -\frac{6}{11}(x - 8)$ 15. $4x + y = -1$
 17. $0.07r + 0.04s = 5$. *Sample answer:* 4 organza, 118 satin; 8 organza, 111 satin; 12 organza, 104 satin

19. a. $y = -2x + 1$ b. $y = \frac{1}{2}x - 4$

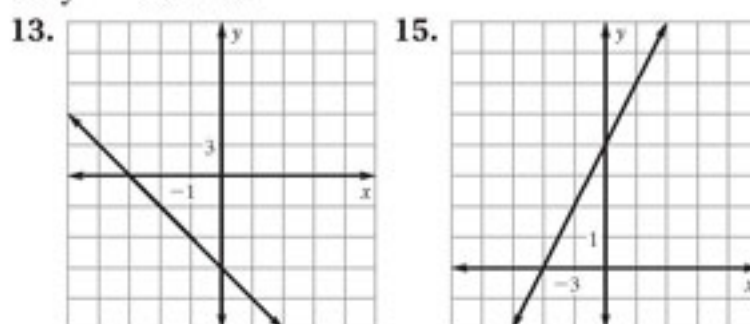


Chapter 4 Extra Practice

1. $y = 3x + 6$ 3. $y = 5x - 1$

5. $y = \frac{1}{2}x - 5$ 7. $y = 2x + 2$ 9. $y = \frac{2}{3}x + 7$

11. $y = -5x + 3$



17. *Sample answer:* $y - 9 = \frac{1}{2}(x - 3)$ 19. $4x + y = 15$

21. $2x + y = 0$ 23. $y = -5x - 22$ 25. $y = -\frac{1}{3}x - 6$

27. $y = \frac{3}{2}x - \frac{33}{2}$

29. *Sample answer:*
 $y = -\frac{5}{6}x + 70$

31. $y = 1.1x + 6.7$; 14.4