Selected Answers

CHAPTER 1

SKILL REVIEW (p. 2) **1.** $0.6, \frac{3}{5}$ **2.** $0.33, \frac{33}{100}$
3. $0.0008, \frac{1}{1250}$ **4.** $1.5, 1\frac{1}{2}$ **5.** $<$ **6.** $>$ **7.** $>$ **8.** $>$
9. 12.25 cm^2, 14 cm **10.** 6 ft^2, 12 ft **11.** 8.32 mi^2, 13.6 mi

1.1 PRACTICE (pp. 6–8) **5.** 30 **7.** 25 **9.** 2 **11.** 15
13. 3 h; $\frac{\text{mi}}{\text{mi/h}} = \text{mi} \cdot \frac{\text{h}}{\text{mi}} = \text{h}$ **15.** 138 mi; $\frac{\text{mi}}{\text{h}} \cdot \text{h} = \text{mi}$
17. time $= \frac{\text{distance}}{\text{rate}}$; time $= t$ h, distance $= 10$ mi,
rate $= 1.25$ mi/h; $t = \frac{10}{1.25}$; 8 h **19.** 60 **21.** 0.25 **23.** 82
25. 2.1 **27.** 5 **29.** $\frac{7}{16}$ **31.** \$2.40 **33.** She did not use the
correct decimal equivalent of 2.5%, 0.025.
35. $1\frac{4}{11}$ mi/min ≈ 1.36 mi/min **37.** $\frac{2}{15}$ km/min ≈ 0.13
km/min **39.** 3 h **41.** 4.3 cal/min **43.** Distances are given
to the nearest foot. Mt. McKinley: $20{,}322$ ft and 8707 ft;
Mt. Elbrus: $18{,}481$ ft and $10{,}548$ ft; Mt. Kilimanjaro:
$19{,}564$ and 9465 ft; Mt. Aconcagua: $22{,}831$ ft and 6198 ft

1.1 MIXED REVIEW (p. 8) **51.** $\frac{3}{10}$ **53.** $2\frac{3}{4}$ **55.** 4 **57.** $10\frac{1}{10}$
59. 70 in.^{2} **61.** 4 **63.** 6 **65.** 8 **67.** 10

1.2 PRACTICE (pp. 12–14) **5.** D **7.** A **9.** 64 **11.** 216
13. 125 **15.** 1000 **17.** 2^3 **19.** 9^y **21.** $3^4 y$ **23.** c^6
25. $(4x)^3$ **27.** 25 **29.** 1296 **31.** 2401 **33.** 729 **35.** 1024
37. $1{,}000{,}000$ **39.** 2197 **41.** 64 **43.** 16 **45.** 100
47. $59{,}049$ **49.** $1{,}953{,}125$ **51.** $262{,}144$ **53.** $1{,}679{,}616$
55. $15{,}625$ **57.** 343 **59.** 4096 **61.** $1, 4, 9, 16, 25$
63. 148.84 ft^2 **65.** 1728 in.^{3} **67.** about $1{,}333{,}333$ ft^3

1.2 MIXED REVIEW (p. 14) **73.** 10.2 **75.** $0.625, 62.5\%$
77. $0.55, 55\%$ **79.** 21 **81.** 4 **83.** $2\frac{1}{4}$

TECHNOLOGY ACTIVITY 1.2 (p. 15)
1. $33{,}554{,}432$; 1.13×10^{15}; 3.78×10^{22}; 1.27×10^{30}
3. 16; 64; 256; 1024; 4096 **5.** 36; 1296; $46{,}656$;
$1{,}679{,}616$; $60{,}466{,}176$

1.3 PRACTICE (pp. 19–21) **5.** 150 **7.** 2 **9.** 0 **11.** 3 **13.** 19
15. 300 **17.** 34 **19.** 18 **21.** 17 **23.** 12 **25.** 16 **27.** 8
29. 11 **31.** 27 **33.** 27 **35.** 27 **37.** 0.125 **39.** 3
43. Calculator B; $15 - [(6 \div 3) \times 4]$ **45.** Calculator A;
$15 + (10 \div 5) + 4$ **47.** $(2 \times \$49.99) + (3 \times \$44.10)$
49. \$28,475 **51.** \$30 **53.** $2\pi rh + 2\pi r^2$ or $2\pi r(h + r)$

1.3 MIXED REVIEW (p. 22) **59.** 8 **61.** $\frac{2}{9}$ **63.** $-\frac{1}{16}$ **65.** 108
67. 1280 **69.** 6144 **71.** $2\frac{1}{2}$ h

QUIZ 1 (p. 22) **1.** 18 **2.** 12 **3.** 32 **4.** 1 **5.** 1 **6.** 18 **7.** 13.5
8. 16.7 **9.** 40 mi/h **10.** 60 mi/h **11.** 60 mi/h **12.** 6^3
13. 4^5 **14.** $(5y)^3$ **15.** 5^2 **16.** $3^6 \cdot t$ **17.** $(7x)^2$ **18.** 7776
19. 432 **20.** 1728 **21.** 33 **22.** $1\frac{2}{7}$ **23.** $\frac{1}{2}$ **24.** $\frac{1}{3}$ **25.** 2
26. 1.728 ft^3

1.4 PRACTICE (pp. 27–29) **9.** B **11.** C **13.** B
15. not a solution **17.** solution **19.** not a solution
21. not a solution **23.** solution **25.** not a solution
27. What number can be added to 6 to get 11? 5
29. What number can be multiplied by 3 to get 12? 4
31. What number can be multiplied by 4 to get 36? 9
33. One less than two times what number is 9? 5
35. What number when divided by 7 gives 3? 21
37. What number cubed gives 125? 5 **39.** solution
41. not a solution **43.** not a solution **45.** not a solution
47. solution **49.** solution **51.** solution **53.** solution
55. not a solution **57.** G **59.** H **61.** B **63.** A
65. the number of ft^2 per station, the number of stations, the
total number of ft^2 available; 20 stations **67.** cost each
time you fill the tank, number of times you fill the tank,
total amount to be paid for gas; yes **69.** 400 m/min
71. 5 h **73.** $0°$C **75.** 8 ft **77. a.** The length of the jet is
1.212 times the wingspan. **b.** It is longer than it is wide;
since $y > 0$, $1.212y > y$.

1.4 MIXED REVIEW (p. 30) **85.** $\frac{1}{4}$ **87.** $\frac{4}{25}$ **89.** y^2 **91.** c^4
93. $(5y)^4$ **95.** $(9a)^6$ **97.** 1^3 **99.** t^6

1.5 PRACTICE (pp. 35–38) **5.** C **7.** B **9.** $x + 10 = 24$
11. $\frac{20}{n} \le 2$ **13.** $x + 9$ **15.** $\frac{1}{2}x + 3$ **17.** $\frac{x}{0.2}$ **19.** $\frac{2^3}{x}$
21. $5^2 - x$ **23.** $9 > 3s$ **25.** $14x = 1$ **27.** $3(x - 2) = 10$
29. $(38 - n) - 23 < 8$ **31.** $(20 - x) - 5 \ge 10$
33. $9 + \frac{b}{10} \ge 11$ **35.** $q \ge 100$ **37.** $\frac{35}{t} \le 7$ **39.** $b = e - 1.50$
41. $c = 3r + 229$ **43.** $V \le 30 - 3$ or $s^3 \le 30 - 3$
45. $P = 4(s - 2)$ **47.** $A = \frac{1}{2}(7 + 9)(h + 7)$
49. The number of subscriptions times the cost of each
subscription equals the amount the club needs to raise.
**51.** 21 **53.** $21 \cdot 15 = 315$; the answer is reasonable.
55. $20m = 260$ **57.** $\frac{\text{dollars}}{\text{mi/h}} \cdot \text{mi/h} = \text{dollars}$
59. The number of weeks times the total of \$20 plus the
additional amount saved per week equals the total saved; let
$x = $ the additional amount saved per week; $12(x + 20) = 480$.
61. Let $x = $ the total number of points the team must equal
or exceed; $x \ge 18\left(\frac{544}{17} + 5\right)$.

1.5 MIXED REVIEW (p. 38) **67.** = **69.** > **71.** <

73.

Fruits and Vegetables Eaten by California Adults

75. 10 **77.** 360
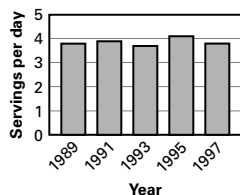
QUIZ 2 (p. 39) **1.** $2\frac{3}{4}$ **2.** 21 **3.** 34 **4.** 12 **5.** 42 **6.** 54

7. not a solution **8.** solution **9.** solution **10.** not a solution **11.** solution **12.** not a solution **13.** Let x = the total cost of the pizza; $\frac{1}{4}x = 2.65$; $10.60.
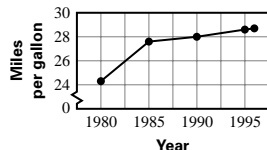
1.6 PRACTICE (pp. 43–45) **5.** true **7.** false **9.** false

11.

Water Requirements
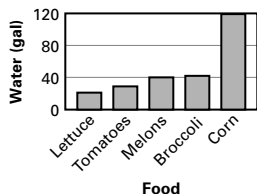
13. paper; about 33 million tons **15.** 6 years **17.** 1991

19.

Passenger Car Fuel Efficiency

1.6 MIXED REVIEW (p. 45) **23.** not a solution **25.** solution

27. $12 = \frac{n}{3}$

1.7 PRACTICE (pp. 49–51)

7. 44.5; 89; 133.5; 178; 222.5; 267

9.

Daytona 500 Fastest Winning Speed
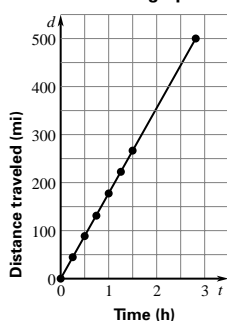
13. Output: 2, 5, 8, 11
15. Output: 0, 5, 10, 15
17. Output: 1, 3, 5, 7
19. Output: 6.5, 8.5, 14.5, 20.5, 26.5 **21.** Output: 19, 16, 13, 12, 11.5 **23.** Output: 0.5, 1.75, 8.5, 19.75, 35.5 **25.** 360 · 2, 720; 360 · 3, 1080; 360 · 4, 1440; 360 · 5; 1800

27.

Temperature
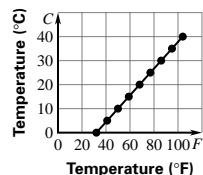
29. domain: 0, 5, 10, 15, 20, 25, 30, 35, 40; range: 32, 41, 50, 59, 68, 77, 86, 95, 104
31. domain: 1, 2, 3, 4, 5, 6, 7; range: 6.25, 7.50, 8.75, 10.00, 11.25, 12.50, 13.75

33. $C = 0.375n$ **35.** Input values represent the number of posters; corresponding output numbers represent the cost of the posters. **37.** Let n = the number of days and a = the amount in dollars that you earn; $a = 2n + 5$.

1.7 MIXED REVIEW (p. 52) **45.** x^6 **47.** y^7 **49.** 6
51. 219 **53.** solution **55.** solution **57.** not a solution
59. $250 million

QUIZ 3 (p. 52)

1.

Arts Activity Attendance
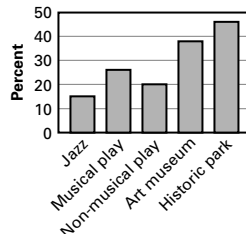
2. Conclusions may include the following:
- Nearly half of all 18-to-24-year-olds attended a historic park.
- More of the 18-to-24-year-olds attended a musical play than attended a non-musical play.
- The events in increasing order of popularity are jazz, non-musical play, musical play, art museum, historic park.
- More than three times as many 18-to-24-year-olds attended a historic park as attended a jazz event.
- About twice as many 18-to-24-year-olds attended an art museum as attended a non-musical play.

3. B **4.** Let t = the number of minutes after you turn on the heat and a = your altitude; $a = 25t + 200$. **5.** Input: 0, 1, 2, 3, 4, 5, 6; Output: 200, 225, 250, 275, 300, 325, 350

CHAPTER 1 REVIEW (pp. 54–56) **1.** 37 **3.** 10 **5.** 10 **7.** 2 h
9. 3125 **11.** 33 **13.** 15,625 **15.** 9 **17.** 1.5 **19.** solution
21. solution **23.** *Sample answer:* The women have won 41 Wimbledon titles, while the men have won 30, so the women have won 11 more Wimbledon titles than the men have won.

25.

Percent of Voting-Age Population That Voted in Yearly Municipal Referendum, 1976–1996
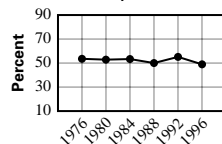
27. Perimeter = Length + Width + Length + Width; $P = 10w$
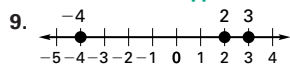
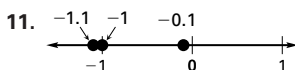**29.** domain = 1, 2, 3, 4, 5; range = 10, 20, 30, 40, 50

CHAPTER 2

SKILL REVIEW (p. 62) **1.** 4.07, 4.6, 5.06, 5.46, 5.5, 6.1
2. $\frac{25}{11}, 2\frac{3}{5}, 2\frac{5}{8}, 2\frac{2}{3}, \frac{11}{4}, 2\frac{5}{6}$ **3.** $\frac{3}{14}$ **4.** $1\frac{1}{2}$ **5.** $3\frac{7}{8}$ **6.** $5\frac{2}{3}$

7. $2\frac{1}{2}$ **8.** $\frac{1}{6}$ **9.** 28 **10.** $6\frac{2}{3}$ **11.** 5 **12.** 2 **13.** 19 **14.** 1
15. 0 **16.** 11

2.1 PRACTICE (pp. 67–70) **5.** < **7.** <
9.

$-4, 2, 3$

11.

$-1.1, -1, -0.1$

13. 4.1 **15.** 103 **17.** negative
19.

$-6.4 < -6.3, -6.3 > -6.4$

23.

$-2.8 < 3.7, 3.7 > -2.8$

25.
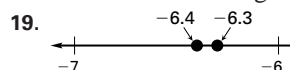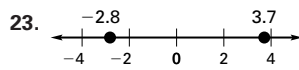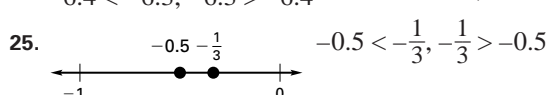
$-0.5 < -\frac{1}{3}, -\frac{1}{3} > -0.5$

27. $-1.8, -0.66, 0.7, 3, 4.6, 4.66$ **29.** $-3, -2.6, -\frac{1}{2}, 0, \frac{1}{2}, 4.8$

31. $-5.8, -\frac{3}{4}, -\frac{1}{2}, \frac{1}{3}, 2.4, 7$ **33.** -8 **35.** -3.8 **37.** $\frac{5}{6}$

39. 2.01 **41.** 7 **43.** 4.5 **45.** $\frac{4}{5}$ **47.** 4.3 **49.** 0.09 **51.** 0

53. $-1, 1$ **55.** False; 0 and all negative numbers are
counterexamples. **57.** False; all real numbers except 0 are
counterexamples. **59.** $\geq$ **61.** $\leq$ **63.** -8 **65.** 0 **67.** Regulus
69. Canopus, Vega, Sirius, and Arcturus **71.** Kobayashi
73. Bemvenuti, Early, Kobayashi, Scranton **75.** Sörenstam
77. 429 ft/min, 429 ft/min **79.** 10°F, 25 mi/h
81. 10°F, 20 mi/h

2.1 MIXED REVIEW (p. 70) **89.** $\frac{5}{6}$ **91.** $\frac{23}{24}$ **93.** $6\frac{13}{63}$ **95.** 5

97. 53 **99.** $\frac{4}{5}$ **101.** $r + 8 = 17$

2.2 PRACTICE (pp. 75–77) **5.** -2 **7.** -5 **9.** 5 **11.** 118°F
13. -3 **15.** -10 **17.** -6 **19.** -4 **21.** 2 **23.** 19 **25.** -19
27. 2 **29.** -8.2 **31.** 6 **33.** identity property of addition
35. property of zero **37.** -85.79 **39.** 126.04 **41.** 5304.128
43. -1 **45.** -10 **47.** 3 **49.** -24 **51.** no; $9 + (-5) +$
$4 + 5 = 13$ **53.** F atom 1: 0, not an ion; F atom 2: -1, ion;
F atom 2 **55.** No; the sum of the losses is greater than the
sum of the profits by \$1011.01. **57.** 10:00 A.M.

2.2 MIXED REVIEW (p. 77) **63.** $\frac{2}{9}$ **65.** $\frac{5}{8}$ **67.** $\frac{13}{18}$ **69.** $\frac{11}{48}$

71. 15 **73.** 37 **75.** no **77.** yes **79.** yes **81.** domain = 1, 2,
3, 4, 5; range = 6.85, 7.70, 8.55, 9.40, 10.25

2.3 PRACTICE (pp. 82–84) **5.** $3 + 8; 11$ **7.** $2 + 3 + (-6); -1$
9. $-3.6 + 6; 2.4$ **11.** $\frac{2}{3} + \frac{1}{6} + \left(-\frac{1}{3}\right); \frac{1}{2}$ **13.** $-7y^2, 12y$, and -6

15.

Each time x increases
by 1, y decreases
by 1.

17. -7 **19.** 5 **21.** -15 **23.** -6 **25.** -4.9 **27.** 9.5 **29.** 3
31. $-1\frac{3}{20}$ **33.** 9 **35.** -23.1 **37.** 3 **39.** 2 **41.** -28 **43.** 23
45. -8 **47.** -28.6 **49.** $-1\frac{17}{18}$ **51.** -4 and $-y$ **53.** $-3x$ and 6
55. -9 and $4b$ **57.** $x, -y$, and -7
59.

61.

63.

65. 3.1 **67.** 1.54 **69.** 5.8 **71.** 275 ft; up **73.** $-\$.66/oz$
75. $-\$.19/oz$ **77.** from start of trail to cave: 410 ft; from
cave to Oak Ridge: 1040 ft; from Oak Ridge to trail
junction: -235 ft; from trail junction to Mt. Parker: 1110 ft
79. -7301 ft, -662 ft, -1883 ft, 77 ft, -1311 ft, 8021 ft

2.3 MIXED REVIEW (p. 85) **85.** $5\frac{2}{3}$ **87.** 16 **89.** 88 **91.** $1\frac{1}{2}$
93. false **95.** Yes; the sum of the profits, \$7932.18, exceeds
the sum of the losses, \$6934.36, by \$997.82.

QUIZ 1 (p. 85) **1.** $-6.2, -5.32, 5.04, 5.3, 5.31, 6.3$
2. $-1.6, -1.07, -0.28, 0.18, 1.06, 1.16$ **3.** $-7.5, -7\frac{1}{3}, 7.3,$
$7\frac{1}{3}, 7.5, 7\frac{2}{3}$ **4.** $-\frac{33}{5}, -6\frac{2}{5}, -6.3, 6.05, 6.42, \frac{33}{5}$ **5.** 3.76
6. 75 **7.** -345 **8.** 27.5 **9.** 7 **10.** 67.4 **11.** 24 **12.** -472
13. -3 **14.** -1 **15.** -14 **16.** 54 **17.** 3.8 **18.** -91 **19.** -0.4
20. $47.3 + (-2.1) + (-11.3) + 12.9$; 46.8 in.

2.4 PRACTICE (pp. 89–90)

5. $\begin{bmatrix} -1 & -4 \\ -5 & 1 \\ 0 & 5 \end{bmatrix}; \begin{bmatrix} -5 & 4 \\ -7 & 7 \\ 2 & -13 \end{bmatrix}$ **7.** yes **9.** no **11.** $\begin{bmatrix} 7 & -5 \\ -3 & -1 \end{bmatrix}$

13. $\begin{bmatrix} 4 & -6 & 7 \\ -8 & -2 & 10 \end{bmatrix}$ **15.** $\begin{bmatrix} 7.7 & 8 \\ 4.1 & -6.6 \\ 9.1 & -12.9 \end{bmatrix}$ **17.** $\begin{bmatrix} 1 & -10 \\ 6 & 4 \end{bmatrix}$

19. $\begin{bmatrix} 2 & -2 \\ 5 & -21 \\ 0 & -1 \end{bmatrix}$ **21.** $-4, -1, 7, -3$ **23.** CD $\begin{matrix} & \text{Sale} & \text{Reg.} \\ \begin{matrix} \\ \text{Tape} \end{matrix} & \begin{bmatrix} 52 & 3300 \\ 28 & 1600 \end{bmatrix} \end{matrix}$

Selected Answers **SA3**

25. $\begin{bmatrix} 76 & 59 \\ 50 & 46 \\ 97 & 66 \end{bmatrix}$ **27.** $\begin{bmatrix} 0.20 & 0.20 & 0.20 \\ 0.35 & 0.35 & 0.35 \\ 0.45 & 0.45 & 0.45 \end{bmatrix}$

2.4 MIXED REVIEW (p. 91) 33. 5^2 **35.** x^2y^3 **37.** $3t^4$
39. -43.7 **41.** 36 **43.** 15 **45.** -21 **47.** -3 **49.** -14 **51.** -3

TECHNOLOGY ACTIVITY 2.4 (p. 92)

1. $\begin{bmatrix} 7 & -6 \\ 6 & -3 \\ -10 & -14 \end{bmatrix}; \begin{bmatrix} 7 & -4 \\ 4 & -3 \\ -8 & -2 \end{bmatrix}$ **3.** $\begin{bmatrix} 10.7 & -1.9 \\ -3.8 & -1.9 \\ 1.7 & -11.1 \\ 7.2 & -8.4 \\ -4.4 & 13.2 \end{bmatrix}; \begin{bmatrix} 4.1 & -8.3 \\ 2.6 & -7.3 \\ 18.1 & -7.7 \\ -3 & 1.2 \\ 3.4 & 1 \end{bmatrix}$

2.5 PRACTICE (pp. 96–98) 5. -8 **7.** 35 **9.** 72 **11.** 70
13. 48 **15.** -47 ft **17.** -16 **19.** 5 **21.** $-\dfrac{11}{8}$ **23.** 24
25. 78 **27.** 12 **29.** 8 **31.** $-7x$ **33.** $-4x^3$ **35.** $-16y$
37. $-y^5$ **39.** x **41.** $3w^3$ **43.** -12 **45.** 21 **47.** -20
49. 76 **51.** -70.70 **53.** 1809.86 **55.** -89.04 **57.** 14.8
59. False; any nonpositive number a is a counterexample.
61. The total amount lost is the loss per pound times the
number of pounds of bananas sold. **63.** \$248.56

65. $-\$125$; \$50 **67.** 940,000 visitors **69.** $\begin{bmatrix} -42 & 28 & -21 \\ 7 & -28 & 63 \end{bmatrix}$

71. Sample answers are given. **a.** $\dfrac{1}{3}(x)(-24)$ **b.** $-\dfrac{1}{6}(x) + 3.5x$

2.5 MIXED REVIEW (p. 98) 77. 10 **79.** 32 **81.** $11, -11$
83.

$-4 < 9, 9 > -4$
85.
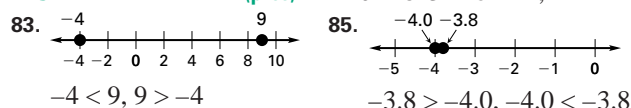
$-3.8 > -4.0, -4.0 < -3.8$
89. $-t$ and 5 **91.** 31 and $-15n$ **93.** $m, -2n,$ and $-t^2$
95. $y, 6,$ and $-8x$ **97.** $-\$11.9$ billion

2.6 PRACTICE (pp. 103–105) 5. $5w - 40$ **7.** $12y - xy$
9. $-\dfrac{5}{6}b + 5$ **11.** 6.9 **13.** simplified **15.** simplified
17. $8t^2 + 3t - 4$ **19.** false; $3(2) + 3(7)$ **21.** true
23. true **25.** $3x + 12$ **27.** $5y - 10$ **29.** $-y + 9$
31. $-4t + 32$ **33.** $x^2 + x$ **35.** $-r^2 + 9r$ **37.** $6x - 2$
39. $-6x + 12$ **41.** $4x^2 + 32x$ **43.** $15y^2 - 10y$ **45.** $9t + 27$
47. $\dfrac{5}{2}x - \dfrac{10}{3}$ **49.** $11x$ **51.** $-17b$ **53.** $y + 4$ **55.** $-0.8t$
57. $-101a$ **59.** $5x^3 - 2$ **61.** $-5y - 2$ **63.** $10s + 14$
65. $4x - 3x^2$ **67.** $9t^2 - 15t$ **69.** $2w^2 + 3w$ **71.** no
73. 16,098 tons **75.** $T = 5000 + 0.02s + 0.06(5000 - s)$;
$T = 5300 - 0.04s$ **77.** $w = 45b + 240$ **79.** $4x - 14$
81. $(x + 5)11 = 11x + 55$; $11x + 55$
83. $T = 0.10C + 0.5(0.10C)$ **85.** Yes; the simplified version
of your friend's equation is identical to your equation.
87. \$3150 **89.** no

2.6 MIXED REVIEW (p. 106) 95. $\dfrac{11}{6}$ **97.** 1 **99.** $\dfrac{1}{435}$
101. $\dfrac{8}{27}$ **103.** 1 **105.** 3 **107.** 5 **109.** -7 **111.** -6 **113.** 8.8

QUIZ 2 (p. 107)

1. $\begin{bmatrix} 5 & -13 \\ -4 & 9 \\ -9 & -8 \end{bmatrix}; \begin{bmatrix} -1 & 1 \\ -6 & 1 \\ -5 & 8 \end{bmatrix}$ **2.** -63 **3.** -21 **4.** 14

5. -2800 **6.** -3 **7.** 10.8 **8.** 110 **9.** 270 **10.** $7.1t$
11. $-13x$ **12.** $-10b^3$ **13.** $-\dfrac{1}{2}x^4$ **14.** $-43x$ **15.** $2y$
16. $-8t$ **17.** $-24 + 3b$ **18.** $20y + 10$

19.

	ft	m
Sears Tower	1454	443
Empire State Building	1250	381
Aon Center	1136	346

2.7 PRACTICE (pp. 111–112) 7. $-\dfrac{1}{8}$ **9.** $-\dfrac{5}{11}$ **11.** -50
13. -72 **15.** $-\$.17$ **17.** -5 **19.** -7 **21.** -11 **23.** $-\dfrac{1}{3}$
25. $-21\dfrac{7}{9}$ **27.** $-43\dfrac{1}{5}$ **29.** -7 **31.** 145 **33.** $-12t$
35. $-\dfrac{x}{36}$ **37.** $\dfrac{3y}{2}$ **39.** $121x$ **41.** $-10x^2$ **43.** $30x^2$ **45.** x
47. $-2w$ **49.** $-11x - 5$ **51.** $9 - x$ **53.** 4 **55.** $217\dfrac{1}{2}$ **57.** 24
59. all real numbers except 2 **61.** all real numbers except 0
63. -2.5 ft/sec **65.** $100x$; $1000x$; $10,000x$; $100,000x$
67. $10,000,000x$ **69.** -11 ft/sec

2.7 MIXED REVIEW (p. 113) 75. 0.75 **77.** 0.1 **79.** 0.17
81. 0.75 **83.** 147 **85.** -250 **87.** $20,736$ **89.** 0.45 **91.** -27
93. 15 **95.** 12 **97.** -1 **99.** -8

2.8 PRACTICE (pp. 117–119)
5. Unlikely; the probability is 0.25. **7.** 0.2 **9.** 0.25
11. 0.65 **13.** 4 to 7 **15.** 1 to 3 **17.** 1 to 3 **19.** 0.5
21. a. 0.6 **b.** 3 to 2 **23.** 0.54 **25.** 582 to 406, or about 3 to 2
27. 1 to 19 **29.** $\dfrac{253}{1310} \approx 0.19$ **31.** 1 to 3

2.8 MIXED REVIEW (p. 120) 39. 8 **41.** $5\dfrac{1}{2}$ **43.** 120
45. $z - 17 = 9$ **47.** $-3 = y + (-6)$ **49.** -13 **51.** -5
53. -11.7 **55.** -17.4 **57.** $-4\dfrac{1}{8}$

QUIZ 3 (p. 120) 1. -49 **2.** 54 **3.** 128 **4.** -4 **5.** -5 **6.** -16
7. -320 **8.** $\dfrac{1}{3}$ **9.** $-7x$ **10.** $\dfrac{7}{x}$ **11.** $18x$ **12.** $5x$ **13.** $35x$
14. $-20t$ **15.** $-55y$ **16.** $\dfrac{x}{36}$ **17.** 0.32 **18.** Unlikely; the
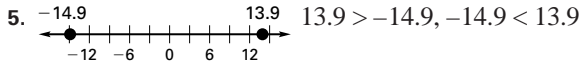probability is less than 0.25. **19.** Certain; the definition
of a certain event is an event with probability 1.
20. Unlikely; the probability is $\dfrac{1}{30,001}$, which is very
small but not equal to 0. **21.** Quite likely; the probability
is about 0.7.

CHAPTER 2 REVIEW (pp. 122–124)
1.

$7 > -6, -6 < 7$
3.

$-9 < 8, 8 > -9$

Selected Answers

5. -14.9 ... 13.9; $13.9 > -14.9, -14.9 < 13.9$
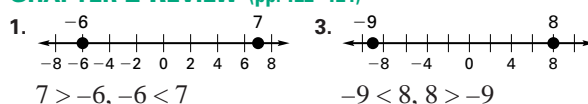
7. 5 **9.** -0.7 **11.** -12 **13.** -1 **15.** -17 **17.** $-4\frac{1}{16}$

19. $\begin{bmatrix} 1 & -4 \\ 1 & 9 \end{bmatrix}$; $\begin{bmatrix} -7 & 0 \\ 15 & -1 \end{bmatrix}$ **21.** -36 **23.** 600 **25.** $-3\frac{7}{9}$

27. 49.5 **29.** -84 **31.** 14 **33.** $5x + 60$ **35.** $5.5b - 55$
37. $-3t - 33$ **39.** $-2.5z + 12.5$ **41.** -4 **43.** -3 **45.** -50
47. -64 **49.** 0.25, 1 to 3 **51.** 0.1, 1 to 9

CHAPTER 3

SKILL REVIEW (p. 130) **1.** 71.5 **2.** 29.315 **3.** 15 **4.** 2.52
5. no **6.** yes **7.** yes **8.** $12r + 18$ **9.** $-18 + 30z$
10. $3x - 21$ **11.** $-9 + 3x$ **12.** $3a + 2$ **13.** $1 + 4y$

3.1 PRACTICE (pp. 135–137) **5.** 13 **7.** 3 **9.** 3
11. Add 4.65 to both sides. **13.** Subtract 28. **15.** Add 15.
17. Subtract -3 (or add 3). **19.** Add -45 (or subtract 45).
21. -3 **23.** 8 **25.** -11 **27.** 10 **29.** $-\frac{3}{4}$ **31.** 5 **33.** 6
35. 29 **37.** -6 **39.** -16 **41.** -9 **43.** B; 8 members
45–49 odd: Sample equations are given. **45.** $x + 7 = 24$; $17
47. $43{,}368 + x = 49{,}831$; 6463 seats **49.** $x - 732 = 645$;
1377 min **51.** 20 cm **53.** $c + 248 = 4218 + 3800 + 2764$;
10,534 acres

3.1 MIXED REVIEW (p. 137) **57.** $\frac{n}{6} = 32$ **59.** $\frac{2}{3}n = 8$ **61.** y
63. x **65.** y **67.** $-a$ **69.** $21 - 14y$ **71.** $-6x - 16$
73. $-5xy - 15x$ **75.** $18xy + 54y^2$

3.2 PRACTICE (pp. 141–144) **5.** 32 **7.** -12 **9.** $-\frac{5}{3}$ **11.** 5
13. *Sample equation:* $\frac{x}{3} = \frac{4}{6}$; 2 **15.** Divide by -2.
17. Divide by $\frac{2}{3}$ (or multiply by $\frac{3}{2}$). **19.** Multiply by $-\frac{4}{3}$.
21. no **23.** no **25.** -2 **27.** $\frac{1}{6}$ **29.** 18 **31.** $\frac{3}{8}$ **33.** 84
35. -40 **37.** 3 **39.** -90 **41.** -1 **43.** $-7\frac{1}{3}$ **45.** 20 **47.** $4\frac{1}{2}$
49–53 odd: Sample equations are given. **49.** $52x = 676$;
13 pieces **51.** $\frac{3}{8}x = 3.3$; $8.80 **53.** $30{,}000x = 10{,}000$; $\frac{1}{3}$ ft^2
57. a. 12 min **b.** 36 sec **59.** $\frac{x}{12} = \frac{4}{8}$; 6 in. **61.** $\frac{5}{4} = \frac{x}{1}$; $1\frac{1}{4}$ c

3.2 MIXED REVIEW (p. 144) **67.** $9n - 12 = 60$
69. $11 = \frac{2}{5}(n - 13)$ **71.** $7y - 9$ **73.** $12y + 15$ **75.** $-19y + 54$
77. 3 **79.** 30 **81.** 7

3.3 PRACTICE (pp. 148–151) **3.** 2 **5.** 13 **7.** 10 **9.** 6 errands
11. yes **13.** no **15.** no **17.** 3 **19.** 14 **21.** 4 **23.** 12
25. 2 **27.** 1 **29.** 8 **31.** 3 **33.** 3 **35.** 8 **37.** -13 **39.** 2
41. The distributive property was applied incorrectly;
$2(x - 3) = 2x - 6$; $5\frac{1}{2}$. **43.** The left side was simplified
incorrectly; $4\left(\frac{1}{4}x - 2\right) = x - 8$; 36.

47, 49. Preferences may vary. **47.** -24 **49.** -1
51. 21, 33, and 69 **53.** *Sample equation:* $34x + 339 = 458$;
3.5 h **55.** 125 students **57.** 48 pounds per square inch
59. Let t = time to complete; $1800t + 2400t = 8400$; 2 h
61. *Sample equation:* $15x + 20x = 910$; 26 h
63. *Sample equation:* $25q + 10(q - 4) + 5(2q) = 500$;
12 quarters, 24 nickels, and 8 dimes

3.3 MIXED REVIEW (p. 151) **67.** 4^2 **69.** a^6 **71.** 2^4
73. 10 **75.** 13.9 **77.** -22 **79.** $\frac{1}{2}$ **81.** -3 **83.** hamburgers:
$134 income, $24 expense; hot dogs: $137 income,
$29 expense; tacos: $118 income, $45 expense **85.** tacos

QUIZ 1 (p. 152) **1.** 17 **2.** $4\frac{1}{2}$ **3.** -2 **4.** $\frac{5}{8}$ **5.** 32 **6.** 3
7. -46 **8.** 12 **9.** -5 **10.** *Sample equation:* $x + 4 = 91$; 87
11. $22\frac{2}{9}$ °C

3.4 PRACTICE (pp. 157–158) **5.** -7; one solution
7. no solution **9.** 5; one solution **11.** 10 pies **13.** 1
15. $\frac{1}{4}$ **17.** 1 **19.** -7 **21.** $-\frac{3}{32}$ **23.** $\frac{1}{4}$ **25.** 2 **27.** $\frac{1}{2}$ **29.** 1
31. all real numbers **33.** 4 **35.** $-\frac{1}{2}$ **37.** no solution **39.** 1
41. 1 **43.** Since $-6 = -6$, you can conclude that the given
equation is true for all real numbers, not that $b = -6$.
45. *Sample equation:* $3x + 25 = 5x$; 12.5 sessions; it is
worthwhile to become a member if you expect to attend
13 or more sessions. **47.** The possible number is $3\frac{1}{2}$ more
than the actual number, 50. **49.** about 12 ft

3.4 MIXED REVIEW (p. 159) **55.** 0.28 **57.** 0.03 **59.** 37.8
61. 410.4 **63.** $74.28 **65.** dollars **67.** hours **69.** 6 cm

3.5 PRACTICE (pp. 163–165) **3.** rate your friend is driving =
52 (mi/h); time after you start driving = t (h); friend's
distance when you leave = 32 (mi); rate you are driving =
60 (mi/h); $52t + 32 = 60t$.
5. *Sample answer:*

7. C; 18 in. **9.** hours **11.** ft **13.** No; according to the
graph the solution is 5 weeks, not 25 weeks.
15. Let x = the width in inches of the photos; $2x + 2 = 6\frac{1}{2}$.
17. *Sample equation:* $45 + 3x = 108 - 4x$; in 9 years
19. $\frac{1}{2}$ mi; $x + \frac{1}{2}$

3.5 MIXED REVIEW (p. 165) **27.** 0.27; 27% **29.** 0.81; 81%
31. -25 **33.** -1.5 **35.** -27 **37.** $1\frac{3}{4}$ **39.** $-\frac{1}{2}$

3.6 PRACTICE (pp. 169–171) **5.** 23.4 **7.** −13.9 **9.** 6.82
11. 3.17 **13.** $33.38 **15.** 36.3; 36.26 **17.** 7.3; 7.32
19. 34.7; 34.70 **21.** 4.33 **23.** 5.78 **25.** 1.71 **27.** −2.88
29. 0.11 **31.** 0.14 **33.** 1.60 **35.** 12.17 **37.** 2.75 **39.** 0.31
41. $-625y - 184 = 2506y$ **43.** $4500n - 375 = 750n + 2000$
49. $7.29 **51.** 0.24, or 24% **53.** *Sample equation:*
$500 + 440x = 2975$; 6 min **55.** 9.75 h; the total number of
hours that you used your Internet service last month
57. $(t - 10)°C$, $0.37(t - 10)$ mm, $[16.8 - 0.37(t - 10)]$ mm

3.6 MIXED REVIEW (p. 172)
61.　　　　　　　　domain: 2, 3, 4, 5, 6;
　　　　　　　　　　range: 13, 15.5, 18, 20.5, 23

63. 3 **65.** −7.9 **67.** $\frac{8}{15} \approx 0.533$ **69.** It increased by $85.25.
71. −$234.87

QUIZ 2 (p. 172) **1.** $\frac{1}{2}$ **2.** $3\frac{1}{4}$ **3.** no solution **4.** $1\frac{2}{5}$
5. no solution **6.** $\frac{1}{4}$ **7.** 0.45 **8.** 1.29 **9.** −0.10 **10.** 0.41
11. C **12.** 10 dogs
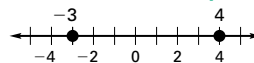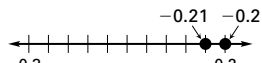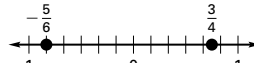
TECHNOLOGY ACTIVITY 3.6 (p. 173) **1.** 12.3 **3.** 5.3

3.7 PRACTICE (pp. 177–179) **9.** $y = 5 - x$ **11.** $b = \frac{2A}{h}$
13. $h = \frac{V}{\pi r^2}$ **15.** $y = 5 - 2x$ **17.** $y = 6x - \frac{13}{2}$
19. $y = -1.5x + 9$ **21.** $y = -10x + 35$ **23.** $y = \frac{3}{4}x - \frac{9}{4}$
25. $y = 12x - 2$ **27.** $y = x - \frac{9}{4}$ **29.** $y = \frac{1}{2}x + 1$
31. $x = 3y - 12$; −18, −15, −12, −9 **33.** $x = \frac{5}{2}y - 3$; −8,
$-5\frac{1}{2}, -3, -\frac{1}{2}$ **35. a.** 0.2; 20% **b.** 0.4; 40% **c.** 0.5; 50%
37. $d = \frac{P - 2112}{64}$ **39.** P is a function of d; P is the
isolated variable. **41.** $2\pi X$ **43.** The first and third columns
are identical.

3.7 MIXED REVIEW (p. 179) **51.** no **53.** $-8b$ **55.** $-3x^3$
57. $16t^2$ **59.** pro sports **61.** 31

3.8 PRACTICE (pp. 183–185) **5.** $213 **7.** $0.45(280) = x$; 126
9. $0.2x = 15$; 75 **11.** $.40/can **13.** about $.93/qt
15. 300 mi/h **17.** 0.05 mi/min **21.** 21,000,000 mi/wk
23. $1\frac{1}{2}$ c, or 1.5 c **25.** 90.1 km **27.** about 300 mi
29. *Sample equation:* $50 \cdot 47 = x$; about 2350 more books
31. $5 **33.** 16% **35.** 65% **37.** about 28.9% **39.** about
1013 people **41.** *Sample estimate:* about 350 students

3.8 MIXED REVIEW (p. 186)
49. $4 > -3$; $-3 < 4$
51. $-0.2 > -0.21$; $-0.21 < -0.2$
53. $\frac{3}{4} > -\frac{5}{6}$; $-\frac{5}{6} < \frac{3}{4}$
55. −1.91 **57.** 1.47 **59. Projected Number of People 85 Years and Older**
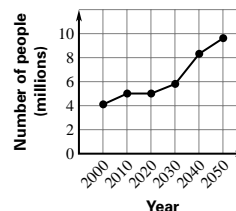
QUIZ 3 (p. 186) **1.** $y = -\frac{3}{2}x + 6$; 9, 6, 3 **2.** $y = 3x + 12$; 6,
12, 18 **3.** $y = -\frac{1}{5}x + 1\frac{3}{5}$; 2, $1\frac{3}{5}, 1\frac{1}{5}$ **4.** $w = \frac{V}{\ell h}$ **5.** $h = \frac{2A}{b}$
6. $r = \frac{P}{C} - 1$ **7.** $93 **8.** 20 in. **9–12.** Equations may vary.
9. $33 \cdot 12 = x$; 396 mi **10.** $0.03x = 42$; 1400 students
11. $900 \cdot \frac{210}{525} = x$; about 360 people **12.** 40%

CHAPTER 3 EXTENSION (p. 188) **1.** Inductive reasoning;
a conclusion is reached based on observation of a pattern.
3. Deductive reasoning; a conclusion is reached because the
hypothesis is true. **5.** *Sample counterexample:* The square
of 1 is equal to itself. **7.** 21, 24, 27 **9.** hypothesis: "you are
in Minnesota in January"; conclusion: "you will be cold"

CHAPTER 3 REVIEW (pp. 190–192) **1.** 11 **3.** −60 **5.** −432
7. −12 **9.** 3 **11.** −8 **13.** −1 **15.** $\frac{15}{2}$ **17.** −2
19. all real numbers **21.** −15 **23.** $12\left(\frac{5}{12}\right) = x\left(\frac{1}{2}\right)$; 10 km/h
25. 2.6 **27.** 0.4 **29.** $r = \frac{S}{\pi s} - R$
31. $y = -\frac{3}{4}x + \frac{7}{2}$; 5, $\frac{7}{2}, 2\frac{3}{4}, -\frac{1}{4}$ **33.** $200

CUMULATIVE PRACTICE (pp. 196–197) **1.** 14 **3.** 81 **5.** 1.01
7. −3 **9.** 2 **11.** −20 **13.** 4 **15.** $\frac{5}{6}$ **17.** yes **19.** yes **21.** yes
23. $4n + 17$ **25.** $-3n > 12$ **27.** $\begin{bmatrix} 5 & 4 \\ -6 & -5 \end{bmatrix}$
29. $\begin{bmatrix} 26 & 14 & -6 \\ -54 & -3 & 35 \end{bmatrix}$ **31.** $\frac{2}{11} \approx 0.18$ **33.** $\frac{1}{6} \approx 0.17$ **35.** 8
37. 15 **39.** 16 **41.** −19 **43.** $-1\frac{4}{11}$ **45.** −2.30 **47.** 1.51
49. $x = \frac{3}{2}y - \frac{1}{2}$; $-3\frac{1}{2}, -\frac{1}{2}, 1\frac{3}{4}, 4$ **51.** $27\frac{7}{9}°C$ **53.** 300 rolls
55. 3639 kronor **57.** 4852 kronor

CHAPTER 4

SKILL REVIEW (p. 202) **1.** $0.5, \frac{1}{2}$ **2.** $0.75, \frac{3}{4}$ **3.** $0.01, \frac{1}{100}$

4. $0.2, \frac{1}{5}$ **5–7.** Sample answers are given.

5. **6.**
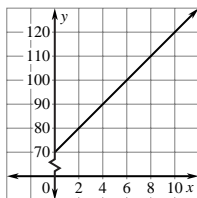
7. domain: $x \geq 0$; range: $y \geq 70$ **8.** -1 **9.** 2

4.1 PRACTICE (pp. 206–208) **3.** $A(1, 1), B(-2, 1), C(0, -2)$
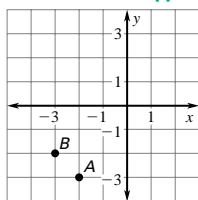
5. **7.**
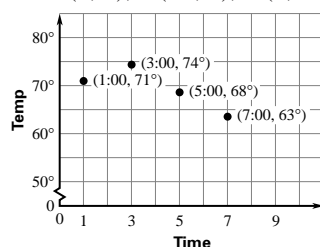
9. *Sample answer:* Yes; The amount spent on snowmobiles increased but not rapidly. **11.** $A(2, 4), B(0, -1), C(-1, 0),$ $D(-2, -1)$
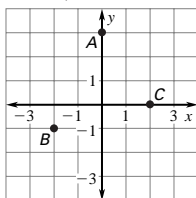
13. **17.**
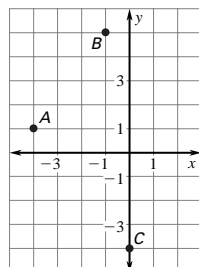
19. Quadrant IV **21.** Quadrant I **23.** Quadrant III
25. Quadrant III **27.** pounds; inches **29.** C
31. It decreases. **35.** **Wing Length vs. Wing-beat Rate**
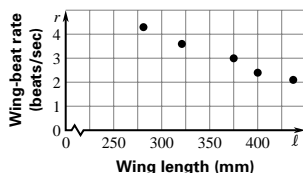
37. As wing length increases, wing-beat rate decreases.

4.1 MIXED REVIEW (p. 208) **43.** 7 **45.** 15 **47.** 39 **49.** 1.07
51. $\frac{2}{3}$

TECHNOLOGY ACTIVITY 4.1 (p. 209) **1.** As age increases, time decreases. **3.** From ages 10–14, as age increases, time decreases. From ages 14–16, time increases, then decreases at age 17.

4.2 PRACTICE (pp. 214–217)
5. **7.** no **9.** no
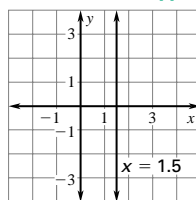
11. about 35,180,000 households **13. a.** no; $y \neq 5$ **b.** yes; $y = 5$ **15.** no **17.** yes **19.** no **21–29 odd:** Sample answers are given. **21.** $(-1, -8), (0, -5), (1, -2)$
23. $(-1, -4), (0, -6), (1, -8)$ **25.** $\left(\frac{1}{2}, -1\right), \left(\frac{1}{2}, 0\right), \left(\frac{1}{2}, 1\right)$
27. $(-1, 3), (0, 2), (1, 1)$ **29.** $(-1, -6), (0, -4), (1, -2)$
31. $y = -\frac{2}{3}x + 2$ **33.** $y = -x + \frac{19}{5}$ **35.** $y = -x - 5$
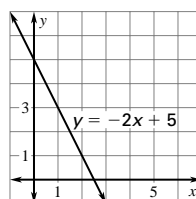
37. **39.**
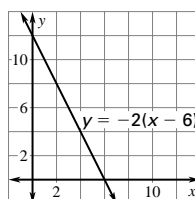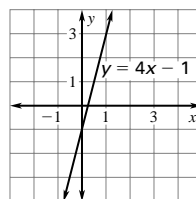
41. **45.**
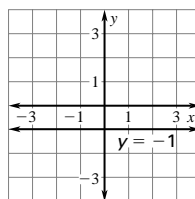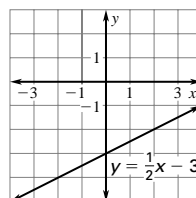
49. **51.**
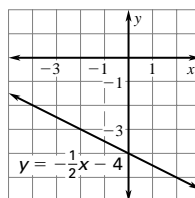
53. D **55.** C **57.**
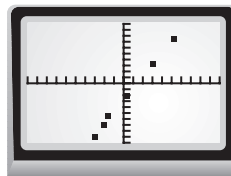
59. $x = -1.6$; $2(-1.6) - 3 = -6.2$, but $y = -5.5$. **61.** $(-8, 11)$
63. $(4, -4)$ **65.** $(3, 0)$ **67.** $y = -2x + 30$ **69.** yes
71. Running time; Calories burned while swimming; 7.1; Calories burned while swimming; Swimming time; $7.1x + 10.1y = 800$ **73.** about 48 min **75.** Horizontal; the number of senators does not vary.

4.2 MIXED REVIEW (p. 217) **81.** 4 **83.** -29 **85.** 0
87. $\begin{bmatrix} 16 & 3 \\ -4 & 18 \end{bmatrix}$ **89.** $\begin{bmatrix} -16 & 50 \\ -9 & 19 \end{bmatrix}$ **91.** 13 **93.** -16 **95.** -15
97. 9

4.3 PRACTICE (pp. 221–223)

5. -3 **7.** $-2; 2$
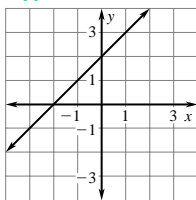
9. $2; -4$
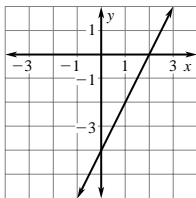
11. $-3; 3$
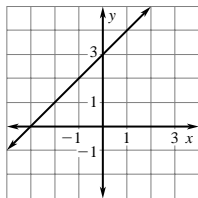
13. *Sample answer:* $8 for adult tickets and $4 for student tickets or $9 for adult tickets and $2 for student tickets

15. $-2; 4$ **17.** 5 **19.** -5 **21.** 9 **23.** -6 **25.** -5 **27.** -4

29. -15 **31.** -8 **33.** 3 **34.** 3

35.

37.
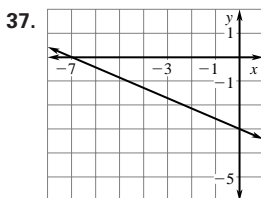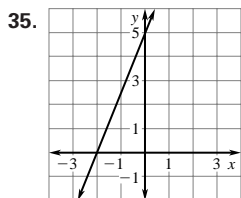
41. A **43.** B **45.** $3; -3$
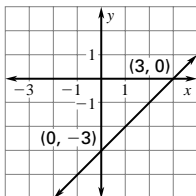
47. $2; -6$
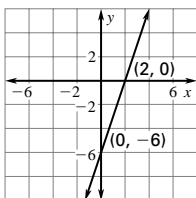
49. $8; 4$
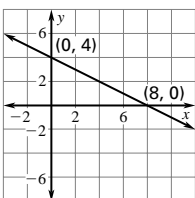
53. $-18; -4$
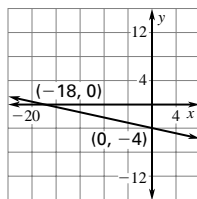
55. $4; 16$
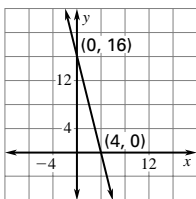
57. True; when $y = 0$, $3x = 30$ and $x = 10$. **59.** False; the graph is a vertical line. **61.** 75; the number of adult tickets that must be sold if no student tickets are sold

63. The possible pairs (x, y) are (0, 120), (5, 112), (10, 104), (15, 96), (20, 88), (25, 80), (30, 72), (35, 64), (40, 56), (45, 48), (50, 40), (55, 32), (60, 24), (65, 16), (70, 8), and (75, 0).

65. Running Time vs. Walking Time

67. Theater Attendance
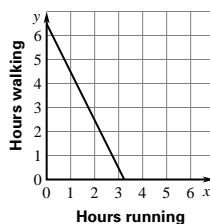
Sample answers:
(1.5, 3.55), (2.25, 2.05),
(2.5, 1.55), (2.75, 1.05),
(3, 0.55)
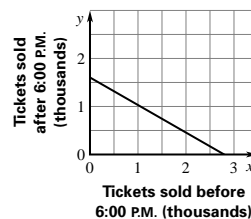
4.3 MIXED REVIEW (p. 223)
71. -4 **73.** -17 **75.** $\dfrac{5}{3}$ **77.** 6
79. 6 **81.** -60 **83.** -2 **85.** 8 **87.** B

QUIZ 1 (p. 224)

1.

2.

3.

4.
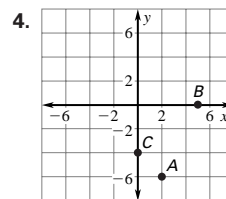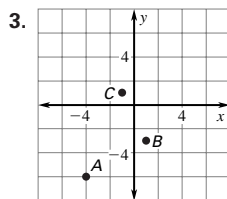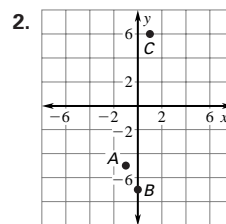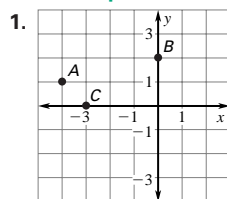
5–10. Sample answers are given.

5. $(0, -6)$, $(3, 0)$, $(2, -2)$ **6.** $(0, -1)$, $\left(\dfrac{1}{2}, 1\right)$, $\left(-\dfrac{1}{2}, -3\right)$
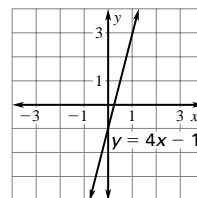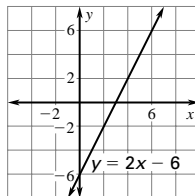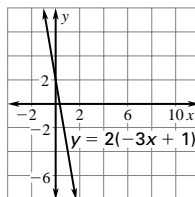
7. $(0, 2)$, $(1, -4)$, $(-1, 8)$ **8.** $(3, -1)$, $(3, 0)$, $(3, 1)$
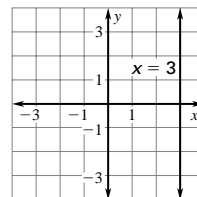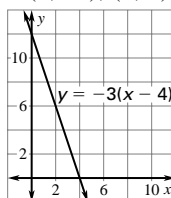
9. $(0, 12)$, $(1, 9)$, $(4, 0)$ **10.** $(-3, -5)$, $(9, -5)$, $(2, -5)$
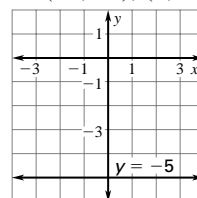
11. 4; 4
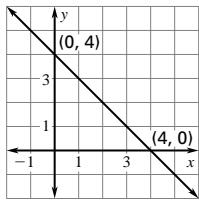
12. $2\frac{1}{2}$; −5
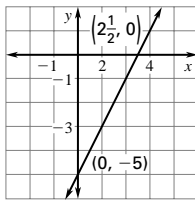
13. −4; 12
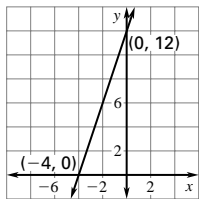
14. 9; 9
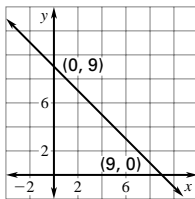
15. $\frac{1}{2}$; −3
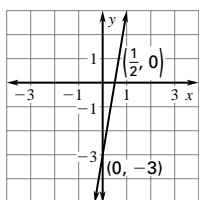
16. −5; 50
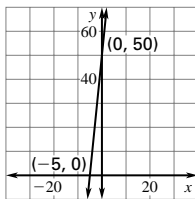
4.4 PRACTICE (pp. 230–233) **5.** 2 **7.** −1 **9.** 3 **11.** −9
13. Negative; the line falls from left to right. **15.** Negative; the line falls from left to right. **17.** Negative; the line falls from left to right. **19.** Undefined; the line is vertical.
21. $-\frac{3}{4}$ **23.** $\frac{3}{4}$ **25.** −4 **27.** $-\frac{5}{2}$ **29.** undefined **31.** $\frac{5}{2}$
33. $-\frac{3}{5}$ **35.** $a{:}\ -1;\ b{:}\ 1$ **37.** $a{:}\ -2;\ b{:}$ undefined **39.** 4
41. 1 **43.** −3 **45.** 3 **47.** No matter which pairs of points are chosen, the slope is the same, $\frac{1}{2}$. **49.** No; the slope of the line that passes through (−2, 4) and (2, −2) is $-\frac{3}{2}$. The slope of the line that passes through (2, −2) and (6, 0) is $\frac{1}{2}$. The slope of the line that passes through (−2, 4) and (6, 0) is $-\frac{1}{2}$. Three distinct lines, each with a different slope, are determined by the three points. **51.** $\frac{3}{50}$; The road grade is the slope of the road expressed as a percent. **53.** \$8/year
55. section 1: $-\frac{1}{20}$; section 2: $\frac{3}{20}$; section 3: $\frac{1}{6}$
57. \$5,500,000/year **59.** about \$.15/year **63.** 1960–1970; about 0.5 million people/year

4.4 MIXED REVIEW (p. 233) **73.** 12 **75.** 11 **77.** 8 **79.** x^2
81. $-2x^2$ **83.** $-\frac{1}{2}x^2$ **85.** $y = -\frac{5}{9}x + 2$ **87.** $y = \frac{1}{4}x + 9$
89. $y = -\frac{3}{5}x + \frac{17}{5}$ **91.** −6; 12 **93.** 3; −6 **95.** $-\frac{1}{2}$; 1

4.5 PRACTICE (pp. 237–238) **3.** yes; 1; 1 **5.** yes; $\frac{1}{2}$; $\frac{1}{2}$ **7.** no
9. 6; 6; 6; 6 **11.** \$36 **13.** $-\frac{2}{5}$; $-\frac{2}{5}$ **15.** −3; −3 **17.** 0.4; 0.4

19. $\frac{5}{4}$; $\frac{5}{4}$ **21.** yes **23.** $y = 3x$ **25.** $y = \frac{2}{9}x$ **27.** $y = 0.2x$
29. $y = x$ **31.** $y = -\frac{1}{3}x$ **33.** 324 lb **35.** yes
37. 45 in.; lower

4.5 MIXED REVIEW (p. 239) **45.** 2 **47.** −5 **49.** −3
51. $x = -\frac{5}{2}y + 6$ **53.**
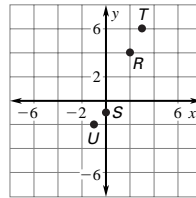
55. No; $3(-4) - 6(-2) =$ 0 and $0 \neq -2$ **57.** No; $-4(-4) - 3(2) =$ 10 and $10 \neq -8$
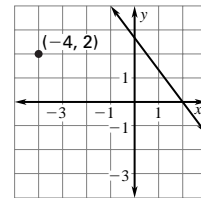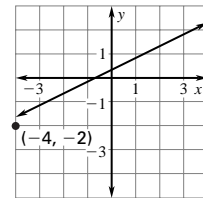
59. 10; $-9\frac{1}{11}$ **61.** 10; 2 **63.** 7; $-\frac{7}{3}$

4.6 PRACTICE (pp. 244–246) **5.** 2; 1 **7.** 1; 3 **9.** 5; −3
11. 30; 50 **13.** 6; 4 **15.** 2; −3 **17.** 0; −2
19. $\frac{1}{4}$; $\frac{1}{2}$ **21.** −3; $\frac{1}{2}$ **23.**

$y = 2x - 1$

25.

$y = -x + 4$

29.

$y = x + 9$

31.

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

33.

$y = 2$

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

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

37. $y = 4x - 3$

$y = 4x - 3$

SELECTED ANSWERS
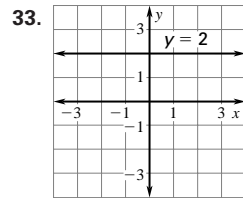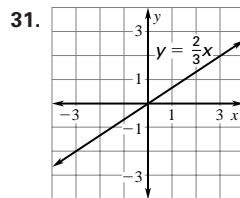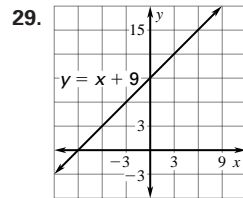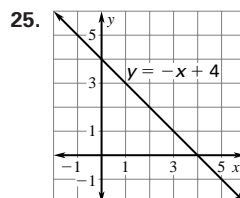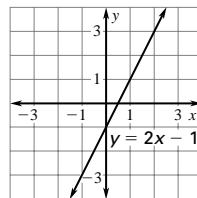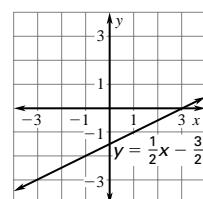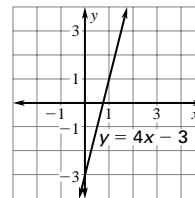
39. $y = -x$
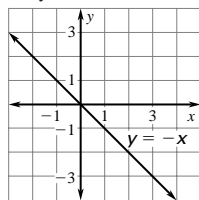
41. $y = -\frac{1}{3}x + 1$
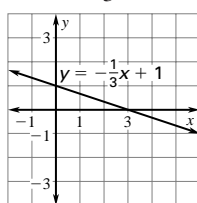
47. Yes; both have slope 2.   **49.** No; one has slope $\frac{4}{3}$, the other has slope $-\frac{4}{3}$.   **51.** Yes; both have slope 3.   **53.** C
55. B   **63.** A triangle; 9 square units; the base is 6 units long and the height is 3 units.

65.

Distance from Home

67. 4 ft
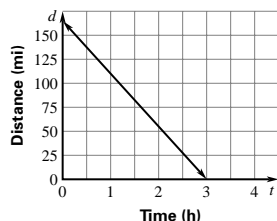
4.6 MIXED REVIEW (p. 247)   **79.** 5   **81.** 12   **83.** 6   **85.** -1
87. A   **89.** from 2001 to 2002

QUIZ 2 (p. 247)   **1.** $\frac{2}{5}$ **2.** $\frac{2}{5}$ **3.** $\frac{7}{9}$ **4.** 2   **5.** 0   **6.** -1 **7.** $y = 5x$

8. $y = 8x$ **9.** $y = 6x$ **10.** $y = \frac{3}{4}x$ **11.** $y = 0.7x$ **12.** $y = \frac{4}{9}x$

13. $y = 2x - 4$
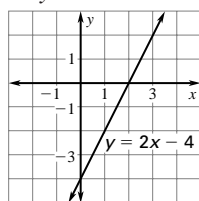
14. $y = -\frac{1}{2}x - \frac{1}{3}$
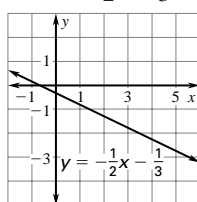
15. $y = \frac{1}{2}x - 6$
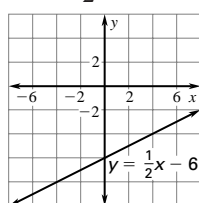
16. $y = x + 2$
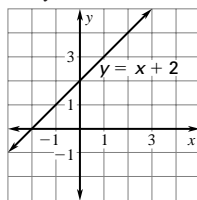
17. $y = -\frac{1}{2}x + 1$
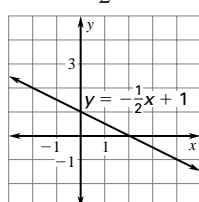
18. $y = -x + \frac{1}{2}$
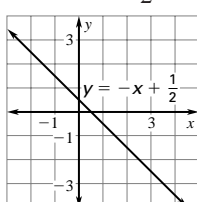
19. $-\$30,080$/month

1.
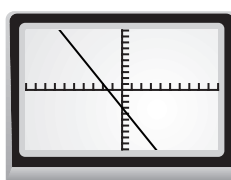
3.
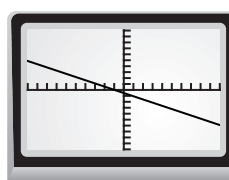
5.
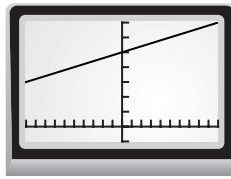
7.
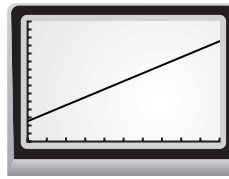
9. *Sample answer:* standard viewing window
11. *Sample answer:* Xmin $= -10$, Xmax $= 30$, Xscl $= 5$, Ymin $= -10000$, Ymax $= 50000$, Yscl $= 5000$
13. about 662.5   **15.** about -1911

4.7 PRACTICE (pp. 253–254)   **7.** A   **9.** B   **11.** C   **13.** B
15. $-4x - 7 = 0$; $y = -4x - 7$ **17.** $4x + 5 = 0$; $y = 4x + 5$
19. $x + 7 = 0$; $y = x + 7$ **21.** 3   **23.** $1\frac{1}{2}$ **25.** -4 **27.** 1   **29.** 1
31. 3   **33.** 2   **35.** -4 **37.** -4 **39.** -5 **41.** 6   **43.** -2
45. 1999   **47.** 2001

4.7 MIXED REVIEW (p. 255)   **53.** no   **55.** no   **57.** no
59. $-64 + 8y$ **61.** $-3q^2 - 12q$ **63.** $-2d + 10$
65. $15w - 10w^2$

4.8 PRACTICE (pp. 259–261)   **3.** -10 **5.** -16
7. yes; 10, 20, 30, 40, 50; 100, 200, 300, 400, 500
9. no   **11.** Yes; no vertical line passes through two points on the graph.   **13.** No; there are vertical lines that pass through two or more points on the graph.
15. yes; 1, 2, 3, 4; 0   **17.** yes; 0, 1, 2, 3; 2, 4, 6, 8
19. yes; 1, 3, 5, 7; 1, 2, 3   **21.** 14; -2; -26 **23.** 2.5; 0; -3.75
25. -1.34; -2; -2.99 **27.** 7.8; 7; 5.8   **29.** C   **31.** B

33.
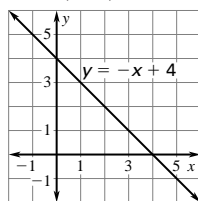
35.
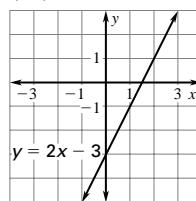
37.
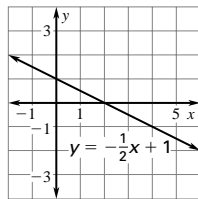
39.
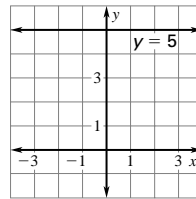
43. -1 **45.** -3 **47.** 1.75   **49.** 0
51. about 16 million   **53.** Yes; each input is paired with exactly one output.   **55.** $f(t) = \frac{100}{17}t$, or $f(t) \approx 5.88t$

4.8 MIXED REVIEW (p. 262)

63. $\begin{bmatrix} 9 & -11 \\ 12 & 7 \end{bmatrix}$ **65.** $\begin{bmatrix} 9.8 & -17.9 \\ -12.3 & -0.1 \\ 12.4 & -13.2 \end{bmatrix}$ **67.** 4 **69.** -3 **71.** $2\frac{1}{2}$
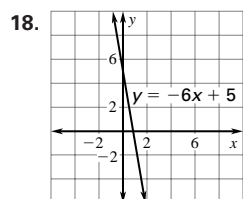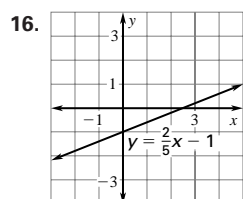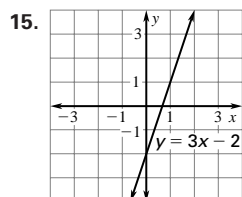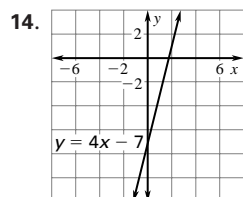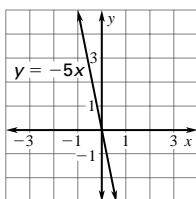
73. $y = 2x + 3$ **75.** $y = 2x - 7$
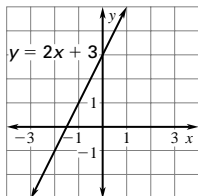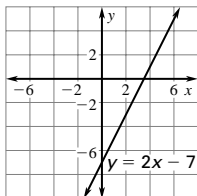
77. $y = \frac{1}{2}x + 1$ **79.**
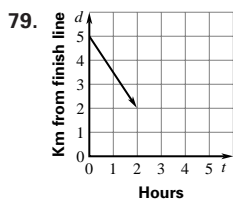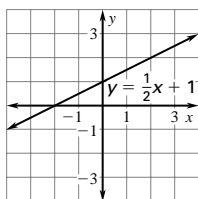
QUIZ 3 (p. 262)
1. -2 **2.** $\frac{1}{2}$ **3.** 1 **4.** $-\frac{1}{2}$ **5.** -13 **6.** $-5\frac{1}{3}$
7. $6; -9; -29$ **8.** $-9; 3; 19$ **9.** $3.25; -2; -9$ **10.** $-4.2; 0; 5.6$
11. $9\frac{3}{4}; 9; 8$ **12.** $2; \frac{2}{7}; -2$ **13.**

14.

15.

16.

17.

18.
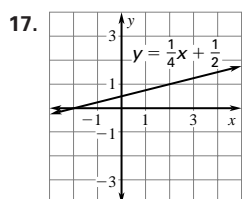
19. 250 lunches

CHAPTER 4 REVIEW (pp. 264–266)

1.

3, 5.

7.

9.

11.

15. 6 **17.** 0 **19.** $y = -\frac{1}{3}x$

21. $y = 3.5x$ **23.**

25. 2 **27.** 8

29. -9

31. 0

Selected Answers **SA11**
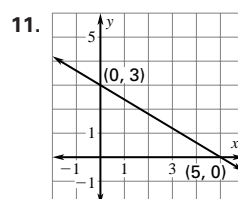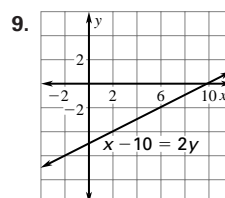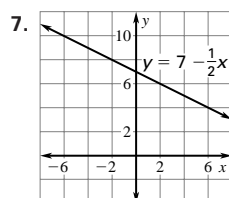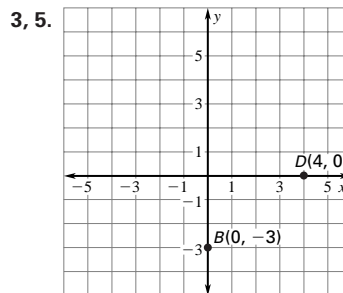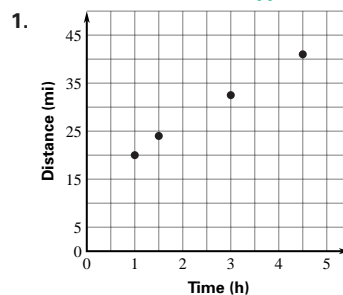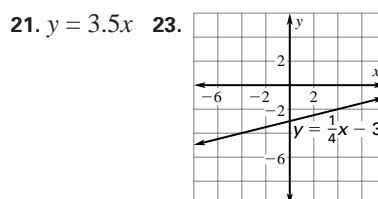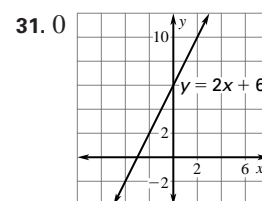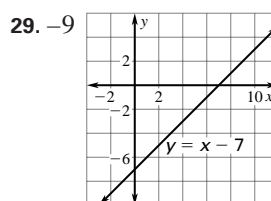
CHAPTER 5

SKILL REVIEW (p. 272) 1. 2 2. 10 3. −6

4.

5.

6. 4.5, 2

7. −5, −3

8. $-\dfrac{4}{3}$, −4
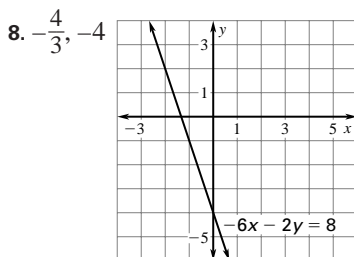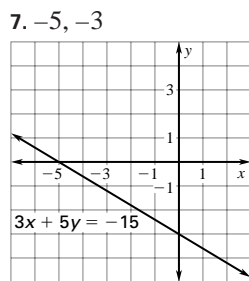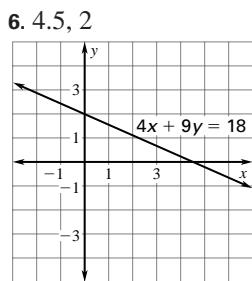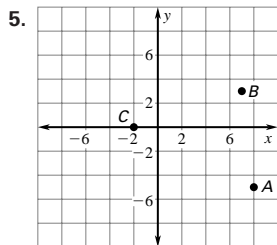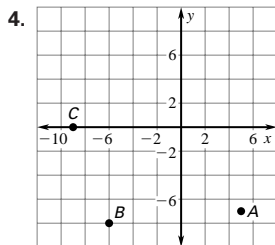
5.1 PRACTICE (pp. 276–277) 3. $y = x$ 5. $y = -x + 3$

7. $y = -3x + \dfrac{1}{2}$ **9.** $y = 1.5x + 4$ **11.** \$22 **13.** $y = x + 2$

15. $y = 2x - 1$ **17.** $y = -\dfrac{1}{4}x + 1$ **19.** $y = -3x - \dfrac{1}{2}$

21. $y = x - 3$ **23.** a: $y = 2x + 3$; b: $y = 2x$; c: $y = 2x - 4$
25. a: $y = 4$; b: $y = 1$; c: $y = -2$ **27.** about 3,710,400
29. \$36.25; \$42.50; \$48.75; \$55 **31.** Let y = your uncle's
weight in lb and x = the number of months from the start
of his weight loss; $y = 180 - 2x$; lb = lb − $\dfrac{\text{lb}}{\text{month}} \cdot \text{months}$.
33. $y = 200 - 50t$; the distance from home decreases as
time increases. **35.** $T = 5x$ **37.** *Sample answer:* If the
club members can sell only 200 calendars, the fundraising
project will not raise any money at all because the cost for
producing 200 calendars will equal the money raised by
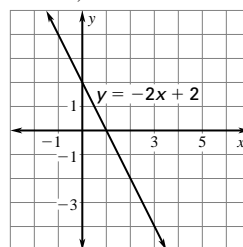selling 200 calendars. Therefore, it is not a very effective
project.

5.1 MIXED REVIEW (p. 278) 41. −3 43. −11

45. Let x = the width of each photograph; $3x + 3\dfrac{1}{2} = 13\dfrac{1}{4}$.
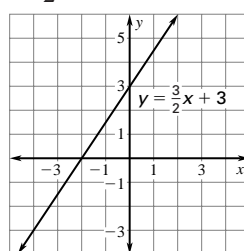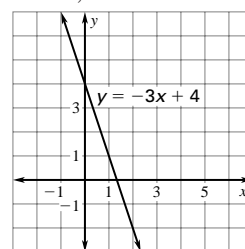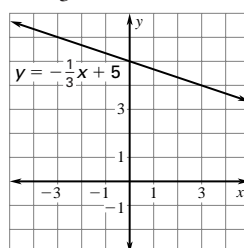
47. $y = 10x$

Sailboard Rental Cost
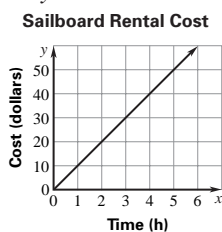
49. −2, 2

51. $\dfrac{3}{2}$, 3
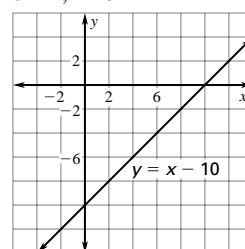

53. −3, 4

55. $-\dfrac{1}{3}$, 5

57. 1, −10

5.2 PRACTICE (pp. 282–283) 3. $y = \dfrac{1}{2}x + \dfrac{5}{2}$ 5. $y = \dfrac{2}{3}x - \dfrac{50}{3}$

7. $y = 5x - 12$ **9.** $y = \dfrac{1}{2}x + 7$ **11.** $y = -8.25x + 616.5$

13. $y = 2x - 7$ **15.** $y = -4x + 1$ **17.** $y = 4x - 1$

19. $y = \dfrac{1}{3}x + 3$ **21.** $y = 4x - 2$ **23.** $y = 4$ **25.** $y = \dfrac{1}{2}x + \dfrac{3}{2}$

27. $y = \dfrac{3}{5}x$ **29.** $x = 2$ **31.** $y = 3x - 12$ **33.** $y = x + 2$

35. $y = -3x + 14$ **37.** $y = -\dfrac{1}{3}x + \dfrac{7}{3}$ **39.** $y = 6x - 33$

41. $y = \dfrac{1}{2}x - 2$ **43.** about 162,000 **45.** \$21,750

47. \$39.80 **49.** \$2

5.2 MIXED REVIEW (p. 284) 53. 32,768 55. 531,441
57. 64 **59.** 10,000 **61.** 10,077,696
63. about 2,541,865,828,000 **65.** $-\dfrac{1}{2}$ **67.** −11 **69.** −20

71. 14 **73.** $\dfrac{3}{4}$ **75.** $-\dfrac{2}{3}$

5.3 PRACTICE (pp. 288–290) 3. $\dfrac{1}{4}$ 5. −1 7. $y = \dfrac{4}{5}x - \dfrac{1}{5}$

9. $y = \dfrac{4}{5}x + \dfrac{9}{5}$ **11.** $y = -\dfrac{10}{3}x - \dfrac{31}{3}$ **13.** $y = \dfrac{1}{2}x$

15. $y = 6x - 27$ **17.** $y = 2$ **19.** $y = -3x - 3$ **21.** $y = \dfrac{8}{3}x + \dfrac{2}{3}$

**23.** $y = -2$ **25.** $y = -2x + 1$ **27.** $y = -\dfrac{6}{7}x + \dfrac{8}{7}$

29. $y = \frac{1}{2}x + \frac{1}{2}$ **31.** $x = 5$ **33.** $y = -\frac{1}{11}x + \frac{17}{11}$

35. $y = -\frac{14}{13}x + \frac{116}{13}$ **37.** $y = 3$ **39.** $y = -\frac{3}{5}x + \frac{27}{5}$

41. $y = -\frac{2}{3}x + \frac{11}{3}$ **43.** $y = -\frac{15}{7}x + \frac{4}{7}$ **45.** Lines p and r;
their slopes are negative reciprocals. **47.** $y = -2x + 13$
49. $\overline{WX}$: $y = -\frac{4}{3}x + 4$; $\overline{XY}$: $y = \frac{3}{4}x - \frac{9}{4}$; $\overline{ZY}$: $y = -\frac{4}{3}x - \frac{13}{3}$

51. $y = -\frac{26}{3}x + 60$; $-\frac{26}{3}$ **53.** $s = \frac{3}{5}T + 331$ **55.** 25°C **57.** 686 m

5.3 MIXED REVIEW (p. 291) **67.** $\frac{6a - 7b}{2}$ **69.** -5 **71.** -35

73. $\frac{1}{3}$ **75.** positive

QUIZ 1 (p. 291) **1.** $y = \frac{4}{3}x + 4$ **2.** $y = -2x + 2$ **3.** $y = \frac{4}{3}x - 4$
4. $y = 2x + 14$ **5.** $y = -3x + 7$ **6.** $y = x - 3$ **7.** $y = x - 2$
8. $y = -\frac{1}{3}x - \frac{1}{3}$ **9.** $y = \frac{13}{3}x + \frac{44}{3}$ **10.** $y = 4$ **11.** $y = 28x + 10$

12.

Canoe Rental Cost


Days

13. $94
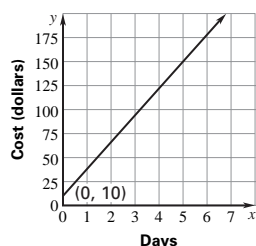
5.4 PRACTICE (pp. 296–297) **7.** negative correlation;
Sample answer: $y = -1.54x + 3.23$ **9.** positive correlation;
Sample answer: $y = 1.16x - 6.22$ **11.** *Sample answer:*
$y = 1.19x + 1.19$ **13.** *Sample answer:* $y = 1.64x + 2.57$
15. *Sample answer:* $y = -1.79x + 15.45$ **17.** positive
correlation **19.** negative correlation **21.** positive
correlation **23.** *Sample answer:* $y = 25x + 50$

25.

Sample Pupil Diameters (Daylight)

Age (years)
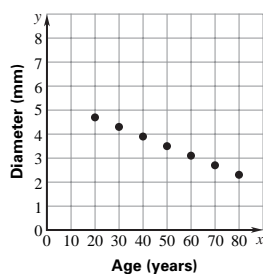
Sample Pupil Diameters (Night)

Age (years)
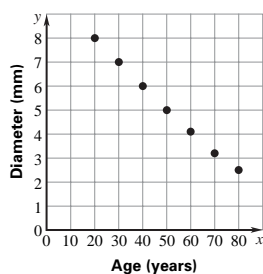
5.4 MIXED REVIEW (p. 298) **35.** horizontal
37. vertical **39.** positive **41.** zero **43.** $y = -\frac{1}{4}x + \frac{11}{2}$
45. $y = -x + 10$ **47.** $y = -\frac{3}{7}x - \frac{2}{7}$ **49.** $y = \frac{7}{2}x - \frac{33}{2}$

TECHNOLOGY ACTIVITY 5.4 (p. 299) **1.** $y = 0.47x + 2.01$
3. $y = 0.95x + 1.41$

5.5 PRACTICE (pp. 303–304) **3.** $y - 4 = \frac{1}{2}(x - 3)$ **5.** $y + 2 = 0$

7. $y - 4 = \frac{1}{2}(x - 3)$ **9.** $y - 10 = 4(x + 3)$ **11.** $y + 7 = -8(x - 7)$ **13.** $y + 1 = -\frac{3}{5}(x + 4)$ or $y - 2 = -\frac{3}{5}(x + 9)$

15. $y - 12 = -2(x - 2)$ or $y - 2 = -2(x - 7)$ **17.** $y + 7 = \frac{3}{2}(x + 4)$ or $y - 2 = \frac{3}{2}(x - 2)$ **19.** $y + 3 = -\frac{1}{2}(x + 1)$
21. $y - 5 = 5(x - 1)$ or $y + 5 = 5(x + 1)$

23. $y - 10 = -\frac{13}{5}(x + 9)$ or $y + 3 = -\frac{13}{5}(x + 4)$ **25.** $y - 10 = -12(x + 5)$ or $y + 2 = -12(x + 4)$ **27.** $y + 9 = -\frac{1}{3}(x + 3)$ or
$y + 8 = -\frac{1}{3}(x + 6)$ **29.** $y + 7 = -(x - 1)$ or $y + 5 = -(x + 1)$
31. $y - 2 = -5(x + 6)$ **33.** $y + 2 = 2(x + 8)$ **35.** $y - 4 = 6(x + 3)$ **37.** $y + 1 = 0$ **39.** $y - 4 = 2(x - 1)$; $y = 2x + 2$
41. $y - 2 = \frac{1}{2}(x - 6)$; $y = \frac{1}{2}x - 1$ **43.** $y + 1 = -1(x - 5)$;

$y = -x + 4$ **45.** $y - 1 = -\frac{1}{8}(x + 1)$; $y = -\frac{1}{8}x + \frac{7}{8}$ **47.** $y + 6 = -\frac{2}{3}(x + 9)$; $y = -\frac{2}{3}x - 12$ **49.** $y = -\frac{1}{3}x - \frac{4}{3}$ **51.** $y - 3 = 2(x - 1)$ or $y - 5 = 2(x - 2)$ **53.** $y + 10 = -\frac{3}{2}(x - 7)$ or
$y + 22 = -\frac{3}{2}(x - 15)$ **55.** $y + 4 = \frac{3}{4}(x + 3)$ or $y + 1 = \frac{3}{4}(x - 1)$ **57.** $d = -0.76t + 120$ **59.** at about 11:38 A.M.
61. at about 11:49 A.M. **63.** at about 2:25 P.M.

5.5 MIXED REVIEW (p. 305) **71.** solution **73.** solution
75. solution **77.**

79.

81.

83.

85.
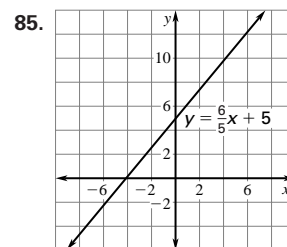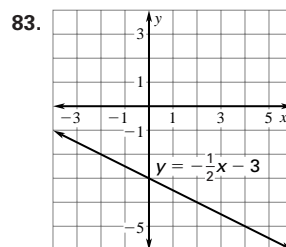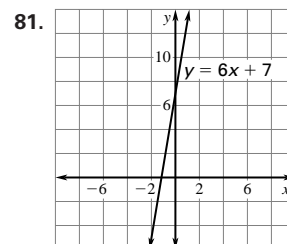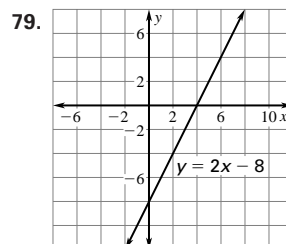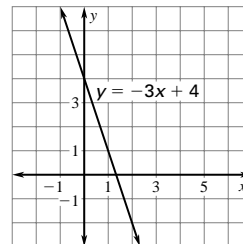
87. $33\frac{1}{3}$%

QUIZ 2 (p. 306) **1.** *Sample equation:* $y = 0.82x - 2.78$;
positive **2.** *Sample equation:* $y = -0.53x - 0.73$; negative
3. *Sample equation:* $y = 1.38x + 0.99$; positive
4. $y + 4 = -1(x - 1)$ **5.** $y - 5 = 2(x - 2)$ **6.** $y + 2 = -2(x + 3)$ **7.** $y + 3 = 0$ **8.** $y - 6 = \frac{1}{2}(x + 6)$

9. $y - 8 = 7(x - 3)$ **10.** $y = \frac{1}{3}x$ or $y + 1 = \frac{1}{3}(x + 3)$

11. $y + 2 = 0$ **12.** $y + 3 = \frac{3}{2}(x + 5)$ or $y - 6 = \frac{3}{2}(x - 1)$

5.6 PRACTICE (pp. 311–313) **5–15 odd:** Sample answers are given. **5.** $5x + y = 6$ **7.** $x - 2y = -16$ **9.** $3x - 2y = 4$
11. $5x - y = 7$ **13.** $x + y = -3$ **15.** $2x + y = 5$
17. 8; 6; 4; 2; 0 **19–53 odd:** Sample answers are given.
19. $x + 3y = 4$ **21.** $2x - 3y = 14$ **23.** $y = -3$ **25.** $3x - y = 8$
27. $6x - 7y = -18$ **29.** $5x - 2y = -18$ **31.** $x + 7y = 6$
33. $2x - y = -19$ **35.** $3x + y = 1$ **37.** $5x - y = 17$
39. $7x + y = 23$ **41.** $2x + y = 17$ **43.** $x - y = -3$
45. $3x - 4y = -13$ **47.** $x + y = -3$ **49.** $y = 0$ **51.** $y = -4$,
$x = 2$ **53.** $y = -3$, $x = 0$ **55.** $y = 4$, $x = -4$ **57.** $y = -1$, $x = 6$
59. $y = 0$, $x = -9$ **61.** $y = -3$, $x = 10$ **63.** The expression
inside the brackets was simplified incorrectly;
$x - (-6) = x + 6$. **65.**
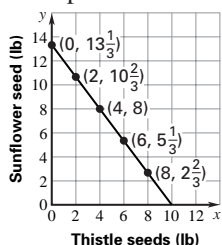
67. *Sample answer:* $2x + 3y = 10$ **69.** 3 students
71. 0% blue, 60% red; 10% blue, 50% red; 20% blue,
40% red; 30% blue, 30% red; 40% blue, 20% red;
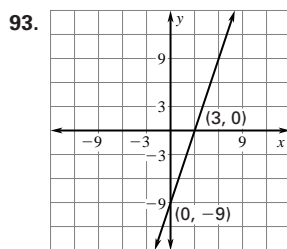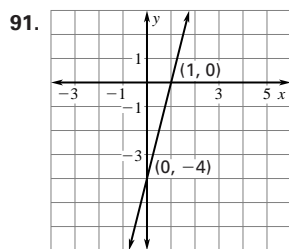50% blue, 10% red; 60% blue, 0% red
73. 0% blue, 80% red; 10% blue, 70% red; 20% blue,
60% red; 30% blue, 50% red; 40% blue, 40% red;
50% blue, 30% red; 60% blue, 20% red; 70% blue,
10% red; 80% blue, 0% red

5.6 MIXED REVIEW (p. 314) **85.** 11 **87.** 4 **89.** $5\frac{1}{4}$

91.

93.

95.
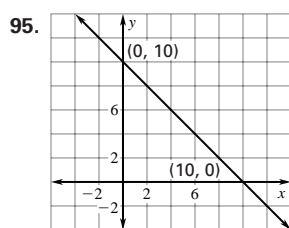
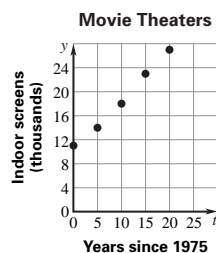**97.** $y = \frac{15}{2}x - \frac{93}{2}$

99. $y = \frac{6}{11}x - \frac{58}{11}$ **101.** $y = -\frac{1}{15}x - \frac{11}{15}$ **103.** $y = -\frac{6}{19}x - \frac{87}{19}$
105. \$118.67 **107.** 25%

5.7 PRACTICE (pp. 319–321) **7.** *Sample answer:* $y = 0.62x +$
1.96 **9.** about 20.56 gal; extrapolation **11.** no **13.** yes

15. yes **17.**

Movie Theaters

19. indoor screens

21. about 35,000 theaters **23.** $y = 0.94x + 16.17$
25. $y = 2.24x + 30.91$ **27.** about \$64.51 billion;
linear extrapolation

5.7 MIXED REVIEW (p. 322)
39.

$-2 < -1, -1 > -2$

41.

$-\frac{1}{2} < \frac{3}{2}, \frac{3}{2} > -\frac{1}{2}$

43.

$-3 > -\frac{7}{2}, -\frac{7}{2} < -3$

45. $y = \frac{1}{2}x - 8$ **47.** $y = -2x - 6$ **49.** $y = 7x + 28$
51. $y = -5x + 44$ **53.** $y = 2x + 23$

QUIZ 3 (p. 322) **1–6.** Sample answers are given.
1. $x - 2y = -6$ **2.** $9x + 3y = 18$ **3.** $-2x + 6y = 8$
4. $9x - y = -12$ **5.** $2x - 3y = -18$ **6.** $14x - 16y = 1$
7. $2x + y = 4$ **8.** $x + 2y = 6$ **9.** $3x + y = 8$ **10.** $2x - y = -5$
11. $3x - y = -40$ **12.** $6x - y = -94$ **13.** Let $x =$ the number
of years since 1985; $y = 0.13x + 74.80$.
14. about 75.32 years **15.** about 78.7 years

CHAPTER 5 REVIEW (pp. 324–326) **1.** $y = 2x - 2$
3. $y = -8x - 3$ **5.** $y = 2x + 22$ **7.** $y = -\frac{11}{7}x - \frac{19}{7}$
9. $y = \frac{3}{10}x + \frac{22}{5}$ **11.** *Sample answer:* $y = 1.98x + 1.11$
13. $y - 4 = \frac{1}{6}(x + 4)$ or $y - 5 = \frac{1}{6}(x - 2)$; $y = \frac{1}{6}x + \frac{14}{3}$
15. $y + 2 = -5(x - 1)$ or $y - 8 = -5(x + 1)$; $y = -5x + 3$
17–21 odd: Sample answers are given. **17.** $8x + 3y = 2$
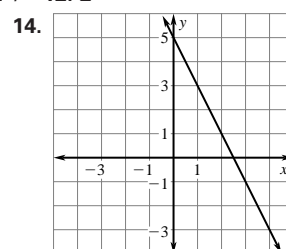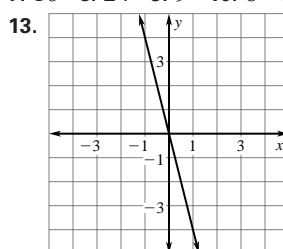**19.** $x + 3y = 2$ **21.** $4x - 3y = 12$ **23.** about 242 million;
linear extrapolation **25.** about 178 million; linear
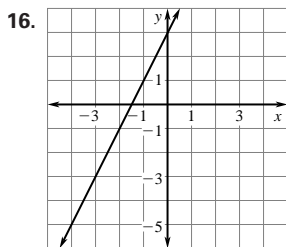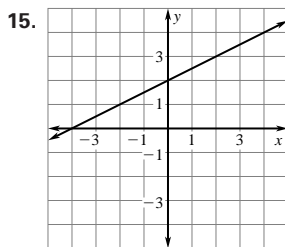extrapolation

CHAPTER 6

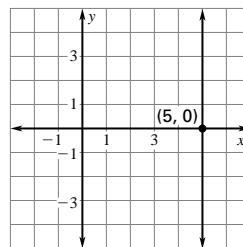**SKILL REVIEW** (p. 332) **1.** solution **2.** not a solution
3. solution **4.** not a solution **5.** not a solution **6.** solution
7. 10 **8.** 24 **9.** 9 **10.** 6 **11.** 7 **12.** 2
13.

14.

15.

16.

6.1 PRACTICE (pp. 337–338) **9.** open dot **11.** open dot

13. closed dot **15.** $y \geq -5$

17. $x > 14$

19. $y \geq -6$

21.

23.

25.

27.

29.

31. $x < 2$

33. $x < 24$ **35.** $p \geq 11$ **37.** $x > 5$

39. $c \geq 4$

41. $m \geq -17$ **43.** $x < 2$

45. $x \geq -10$

47. $a < -10$
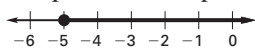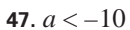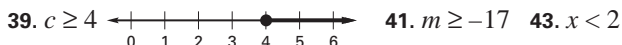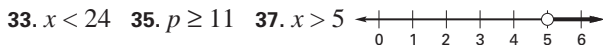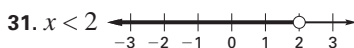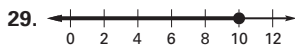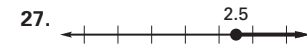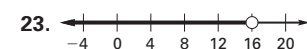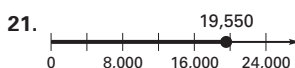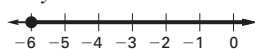
49. $m \geq -5$ **51.** $x \leq -5$ **53.** $a \geq 20$ **55.** $x < 5$; E

57. $x > 5$; C **59.** $x \geq 0$; A **61.** $x < \dfrac{6}{55}$

63. $M < 1376$ **65.** $\ell < 1700$
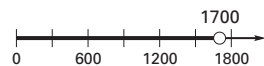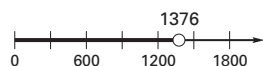
67. $131 \leq f \leq 587$

6.1 MIXED REVIEW (p. 339)

71. $\dfrac{1}{9}$ **73.** 14 **75.** 56 **77.** 3 **79.** -4

81. $y = \dfrac{1}{2}x - 1$; $(0, -1)$ and $(2, 0)$
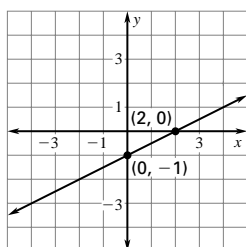
83. $y = 4$; the line does not cross the x-axis and crosses the y-axis at $(0, 4)$.

85. $x = 5$; the line crosses the x-axis at $(5, 0)$ and does not cross the y-axis.
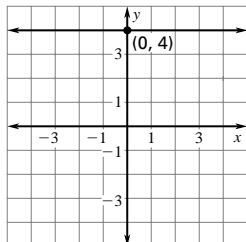
87. $d = 0.12t$

6.2 PRACTICE (pp. 343–344) **5.** $y > -3$ **7.** $x \leq 3$ **9.** $x \leq 10$

11. $x < -4$ **13.** $x < -\dfrac{3}{4}$ **15.** $x > -18$ **17.** $x \geq \dfrac{7}{6}$ **19.** $x \geq -3$

21. $x < 3$ **23.** $x \leq -5$ **25.** $x > -9$ **27.** $x \geq 12$ **29.** $x > -8$

31. $x \geq 11$ **33.** $x > 6\dfrac{2}{3}$ **35.** $x > \dfrac{1}{6}$ **37.** $1.25r + 5 \leq 25$;

16 rides **39.** $0.75t + 14 \leq 18.50$; 6 toppings **41.** 2 years

43. $x > 4$ m **45.** $x < 10$ ft **47.** $x \leq 5$ in.

6.2 MIXED REVIEW (p. 345) **55.** -10 **57.** 12 **59.** $\dfrac{16}{17}$

61. $t > 2\ell$ **63.** 3 **65.** 0.75

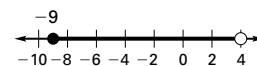**6.3 PRACTICE** (pp. 349–350)

3. $2 < x < 5$

5. $3 < x < 4$

7. $2 < x \leq 4$ **9.** $x < -2$ or $x > 1$ **11.** $1 \leq d \leq 3$
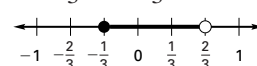
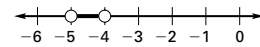**13.** $x > 7$ or $x < 5$ **15.** $-9 \leq x < 4$
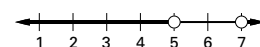
17. $-6 < x < -1$

19. x is greater than -2 and less than 9. **21.** x is greater than or equal to 1 and less than or equal to 6. **23.** x is less than or equal to -5 or greater than or equal to 10.
25. x is greater than -2 and less than or equal to 9.

27. $-5 < x < -4$

29. $-\dfrac{1}{3} \leq x < \dfrac{2}{3}$

31. $x > 3$ or $x \leq 1$

33.

$2 < x \leq 5$; solution

35.

$-5 < x \leq 7$; solution

37. $85{,}000 \leq x \leq 2{,}600{,}000$ **39.** *Sample answer:* A solution would be a number on the graph of both inequalities. Since the graphs do not overlap, there are no such numbers.
41. A **43.** $10^8 < d < 10^9$

6.3 MIXED REVIEW (p. 351) **49.** 7 **51.** 10 **53.** 16.5

55. -8 **57.** 16 **59.** -12 **61.** -7 **63.** 7.8 **65.** 3

67. at least 30 times **69.** 4 mi

QUIZ 1 (p. 352) **1.** $x < 5$

2. $x \leq -8$

3. $x \leq 4$

4. $x \le -10$

5. $x \le -4$

6. $3 < x < 12$

7. $x < 2$
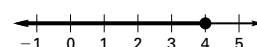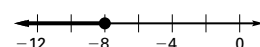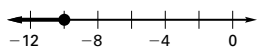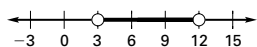
8. $x \ge 17$
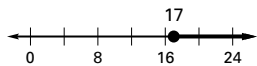
9. $-12 \le x \le -2$

10. $x > -9$ or $x < -12$
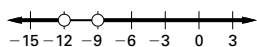
11. $x > 5$ or $x < -1$

12. $x < -1$ or $x > 5\frac{4}{5}$
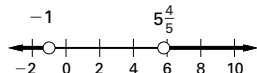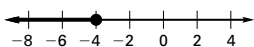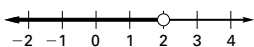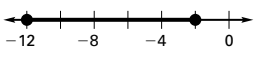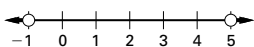
13. $x > -\frac{5}{6}$ or $x < -4$
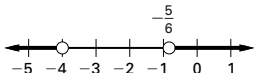
14. $x \ge 52$ **15.** $-128.6 < T < 136$

6.4 PRACTICE (pp. 356–357)

7. 0   **9.** -6, 14   **11.** $\frac{1}{3}$, $-1\frac{2}{3}$

13. C   **15.** $-10 < x < -2$ **17.** $-2 \le x \le 1\frac{1}{3}$ **19.** -7, 7

21. -25, 25   **23.** -16, 6   **25.** 3, 7   **27.** -12, 6   **29.** -3.8, 10.2

31. -5, 6   **33.** $-9\frac{1}{3}$, 6   **35.** -7, 11   **37.** -8.2, 1   **39.** -2, 3

41. $-1 \le x \le 10$ **43.** $x < -0.8$ or $x > 5.2$ **45.** $x \le -2$ or $x \ge 8$

47. $-1 < x < 9$ **49.** $-14 \le x \le 20$
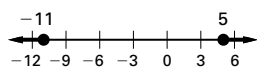
51. $x \le -11$ or $x \ge 5$ **53.** $x < -3\frac{1}{2}$ or $x > \frac{1}{2}$
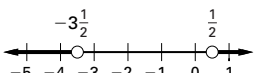
55. $-6 < x < 0$ **57.** $-5 \le x \le 4\frac{3}{5}$
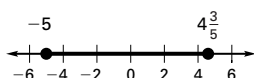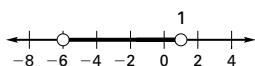
59. $-6 < x < 1$ **61.** $|x - 15| \le 7$

63. $|x - 28| \le 4$ **65.** orange or red   **67.** green

6.4 MIXED REVIEW (p. 358)

75. $\begin{bmatrix} 8 & -17 \\ 9 & 5 \end{bmatrix}$ **77.** $y = -\frac{2}{3}x + 4$

79.

81.
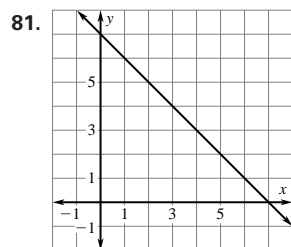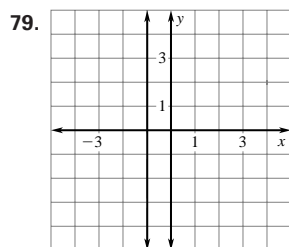
83. $y + 5 = -2(x - 2)$; $y = -2x - 1$ **85.** 57 mi/h

TECHNOLOGY ACTIVITY 6.4 (p. 359)

1. -7, 1   **3.** -10, 18   **5.** -4, 64   **7.** 1.8, 6.8   **9.** -50, -22

6.5 PRACTICE (pp. 363–365)

5. solution
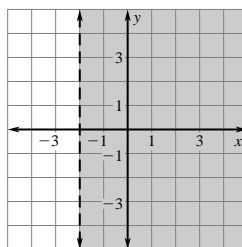
7. not a solution
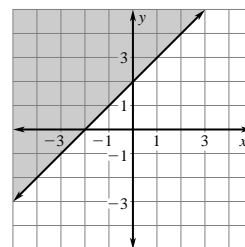
9. solution   **11.** solution

13. Let $x =$ the number of 2-point shots and $y =$ the number of 3-point shots; $2x + 3y \ge 12$.   **15.** solution, not a solution

17. solution, solution   **19.** not a solution, not a solution

21. solution, not a solution

31.

33.

35.

37.

43. D   **45.** E   **47.** C   **49.**

53.
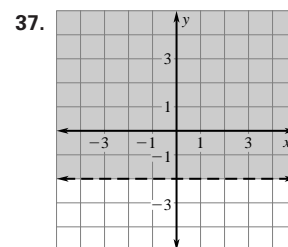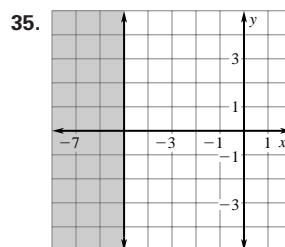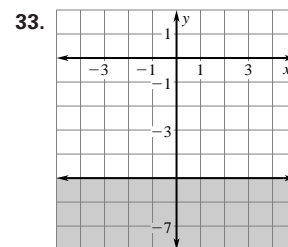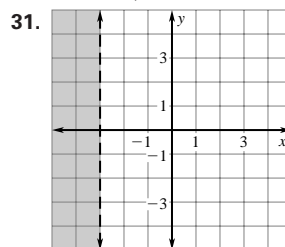
59.
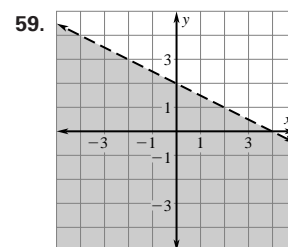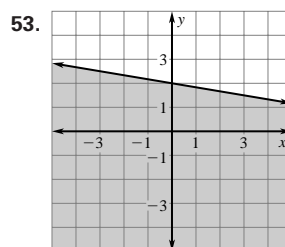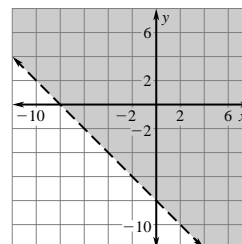
61. $y \geq -2x + 2$ or $2x + y \geq 2$ **63.** $y < 2x$ or $2x - y > 0$
65. a. $3x + 7y < 21$
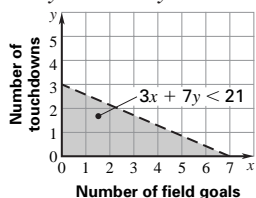
b. No; only points for which both coordinates are nonnegative integers represent solutions, since only a whole number of touchdowns or field goals can be scored. The real-life solutions are (0, 0), (0, 1), (0, 2), (1, 0), (1, 1), (1, 2), (2, 0), (2, 1), (2, 2), (3, 0), (3, 1), (4, 0), (4, 1), (5, 0), and (6, 0). **67. a.** Let (x, y) represent x cups of cereal and y cups of skim milk; the possible solutions are (1, 1), (1, 2), (1, 3), (1, 4), (2, 1), (2, 2), (2, 3), (3, 1), (3, 2), (4, 1).
b. *Sample answer:* 1 glass of tomato juice, 2 cups of cereal, and 2 or 3 cups of milk **c.** The possible solutions are all those in part (a) as well as (1, 5), (2, 4), (3, 3), (4, 2), and (5, 1). *Sample answer:* one glass of tomato juice, 3 cups of cereal, and 2 cups of milk

6.5 MIXED REVIEW (p. 366) **75.** 19 **77.** $r = \dfrac{d}{t}$

79.

81.
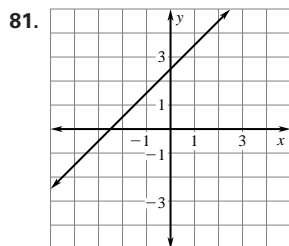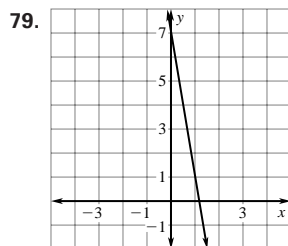
83. $-5, 2$ **85.** $1, -\dfrac{1}{5}$ **87.** $0, -2$ **89.** $3, -6.5$ **91.** $-\dfrac{3}{2}, 5$

QUIZ 2 (p. 366) **1.** $-15, 15$ **2.** $-22, 22$ **3.** $-9, 3$
4. $-8, 12$ **5.** $-7, 0$ **6.** $-\dfrac{5}{3}, 3$

7. $x < 3$ or $x > 5$
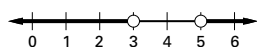
8. $-9 < x < -5$
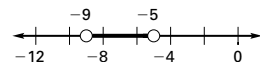
9. $3 \leq x \leq 21$
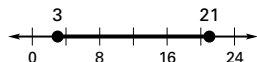
10. $x < -2$ or $x > \dfrac{5}{2}$
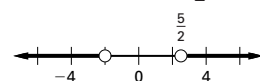
11. $-16 \leq x \leq 9$
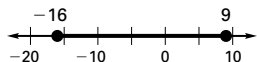
12. $x < -6$ or $x > 5$
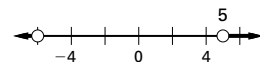
13. solution, solution **14.** not a solution, solution
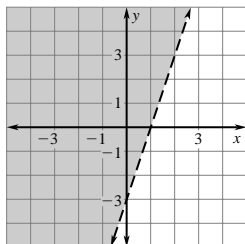**15.** not a solution, solution **16.** solution, not a solution

17.

18.

19.

20.

21.

22.
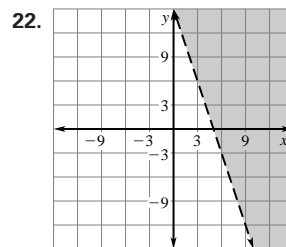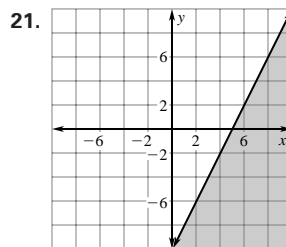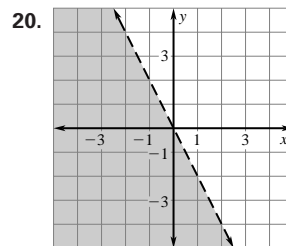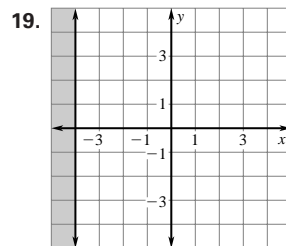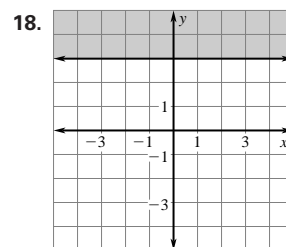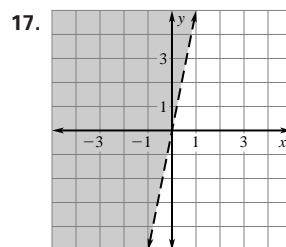
23. $|x - 104| \leq 39$

TECHNOLOGY ACTIVITY 6.5 (p. 367)
1, 5. The lines are not part of the solution.

1.

3.

5.

7.
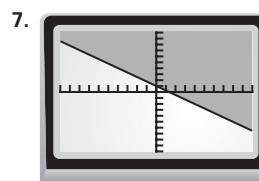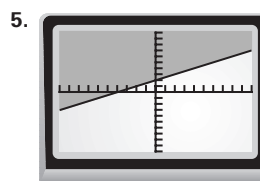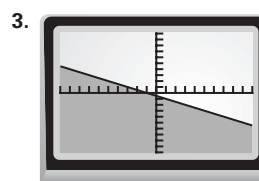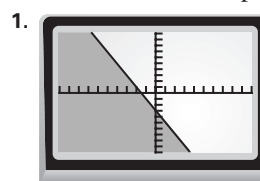
13. $y > x$

6.6 PRACTICE (pp. 371–373) **5.** 3, 2, 2 **7.** $1, -\dfrac{1}{2}$, no mode
9. 11, 13, 13, 15, 16, 17, 18, 20, 20, 22, 25, 27, 27, 28, 31, 33, 34, 37, 38
11. 50, 52, 54, 60, 63, 65, 70, 74, 74, 74, 75, 78, 78
13.

0	1 2 3 4 5
1	
2	0 0 2 4 6 8 8 8
3	0 1 7 9

Key: 2 | 0 = 20

1, 2, 3, 4, 5, 20, 20, 22, 24, 26, 28, 28, 28, 30, 31, 37, 39

15. 30, 33, 37, 39, 44, 48, 52, 54, 61, 61, 62, 68, 68, 76, 76, 76, 77, 79, 80, 81, 82, 84, 86, 87, 87 **17.** 7, 7, 10
19. 6, 6, 6 **21.** 8, 7.5, 5 and 10 **23.** 4.19, 3.98, 1.2
25. 72.8, 66 **27.** yes; 61

29. No; the mean salary of the other 99 adults is $25,000. The median and mode (both $25,000) are much more representative of the "average" salary. **31.** *Sample answer:* The median (619) and the mode (619) are both slightly more representative than the mean (753) because they are closer to more scores in the lower three fourths of the data.

33.
```
 1 | 3 24 25
 2 | 3 20 22
 3 | 17
 4 | 1  8 14 17 30 30
 5 | 10
 6 | 3  5 13 24
 7 | 31
 8 | 21 26
 9 | 12
10 | 11 17
11 |  4 11 28
12 | 9 15 28    Key: 12 | 9 = 12–9 (Dec. 9)
```
1–3, 1–24, 1–25, 2–3, 2–20, 2–22, 3–17, 4–1, 4–8, 4–14, 4–17, 4–30, 4–30, 5–10, 6–3, 6–5, 6–13, 6–24, 7–31, 8–21, 8–26, 9–12, 10–11, 10–17, 11–4, 11–11, 11–28, 12–9, 12–15, 12–28

35.
```
20 | 44
21 | 93
22 | 14 17 26 52
23 | 93
24 | 78
25 | 70 74      Key: 25 | 70 = 257.0
```
204.4, 219.3, 221.4, 221.7, 222.6, 225.2, 239.3, 247.8, 257.0, 257.4

37. 300

39. *Sample answers:*
• About half of the 17 top male and female golfers had fewer than 40 tournament wins.
• For both males and females, by far the most common stem was 3, meaning between 30 and 39 tournament wins.
• There were 4 male and 2 female golfers with 60 or more tournament wins.

6.6 MIXED REVIEW (p. 374)

45. 358   **47.** not a solution   **49.** A   **51.** −1   **53.** $-\dfrac{1}{2}$

55. $x \geq 9$

57. $-8 \leq x < -2$

59. $x \leq -25$ or $x \geq -7$
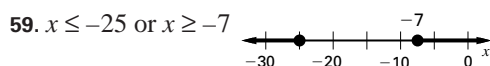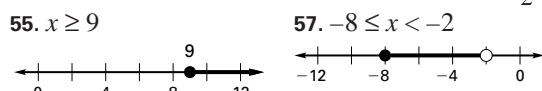
6.7 PRACTICE (pp. 378–380)

5. 2, 4, 6   **7.** 6, 11, 16   **9.** C   **11.** 5, 6.5, 9   **13.** 4, 5, 7

15.

17.

19. Days of Rainfall

21. Movie Attendance
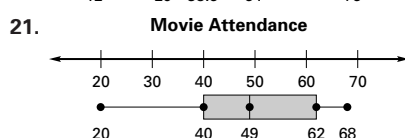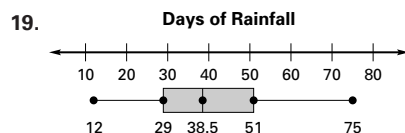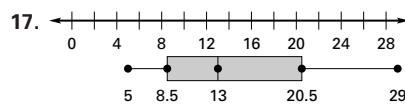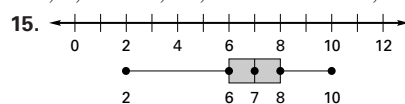
23. *Sample answer:* 10, 11, 11, 12, 14, 15, 16, 18, 20, 21, 25, 27, 27, 29, 30, 38

25. 3.6, 3.8, 4.8, 6.2, 6.7, 7.0, 7.1, 7.7, 8.4, 8.8
```
3 | 6  8
4 | 8
5 |
6 | 2  7
7 | 0  1  7
8 | 4  8     Key: 8 | 4 = 8.4 oz
```
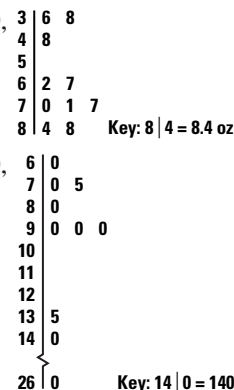
27. 60, 70, 75, 80, 90, 90, 90, 135, 140, 260
```
 6 | 0
 7 | 0  5
 8 | 0
 9 | 0  0  0
10 |
11 |
12 |
13 | 5
14 | 0

26 | 0       Key: 14 | 0 = 140 min
```
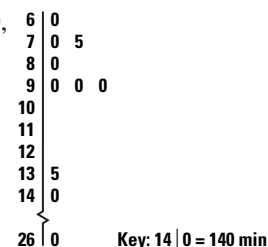
31. 0.75 h   **33.** No. *Sample answer:* More people travel 0.5–1 hour; the box represents about 50% of the data, each whisker about 25%.

35.
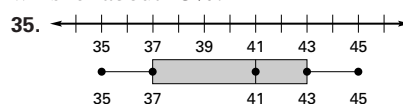
6.7 MIXED REVIEW (p. 381)

39. $x = \dfrac{1}{4}y + 1$; $\dfrac{1}{2}$, $\dfrac{3}{4}$, 1, $1\dfrac{1}{4}$

41. $x = \dfrac{3}{2}y - \dfrac{5}{2}$; $-\dfrac{11}{2}$, −4, $-2\dfrac{1}{2}$, −1   **43.** $10.50/h

45. solution   **47.** not a solution

49. *Sample answer:* $y = 1430x + 64{,}500$ (in thousands)

QUIZ 3 (p. 381)

1.
```
0 | 5  7
1 | 0  6
2 | 0  3  4  5  9
3 | 1  2  7  8    Key: 3 | 1 = 31
```
5, 7, 10, 16, 20, 23, 24, 25, 29, 31, 32, 37, 38

2.
```
1 | 2  8
2 | 6  7
3 | 3  3
4 | 2  4  6  7
5 | 9
6 | 1        Key: 5 | 9 = 59
```
12, 18, 26, 27, 33, 33, 42, 44, 46, 47, 59, 61

3. 8, 9, 9 and 10   **4.** 37.5, 41, no mode

5. 8.5, 13, 18

6. 20, 45, 70

7. 9, 40.5, 56

8. 4, 8.5, 13
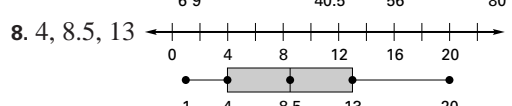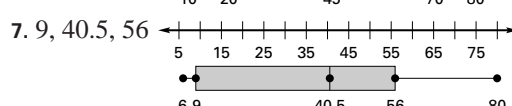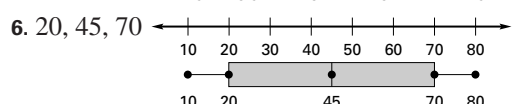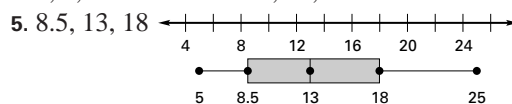
9. Mean: 39
Median: 40
Mode: 57

TECHNOLOGY ACTIVITY 6.7 (p. 382)

1. (least: 4; greatest: 19);   **3.** (least: 20.1; greatest: 43.4);
quartiles: 10, 13.5, 18   quartiles: 23.2, 25.7, 38.65
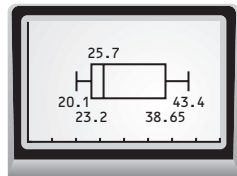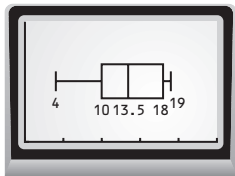
CHAPTER 6 REVIEW (pp. 384–386)
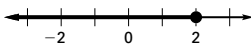
1. $x \le 2$ **3.** $x < -15$
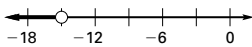
5. $x > -\dfrac{2}{3}$ **7.** $x \le 5$ **9.** *Sample answer:* x is greater than 2
and less than 5.   **11.** x is less than or equal to $-1\dfrac{1}{4}$ or x is
greater than 7.   **13.** $-6, 16$ **15.** $-11 \le x \le 1$
17. $-4\dfrac{2}{3} \le x \le 3\dfrac{1}{3}$

19.   **21.**
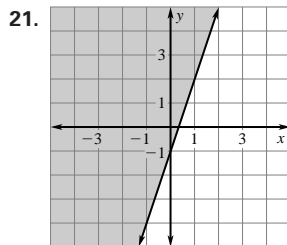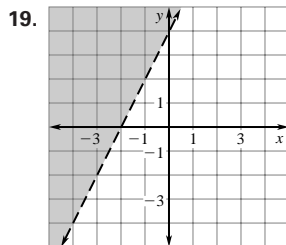
23. 72, 74.5, 58 and 78   **25.** *Sample answer:* The
temperatures in Tokyo are much higher. The highest
Paris temperature is only slightly higher than the median
Tokyo temperature. Only 25% of the Paris temperatures
are at least 15.3°, while half of the Tokyo temperatures are
at least 15.85°.

CUMULATIVE PRACTICE (pp. 390–391)   **1.** 7   **3.** 45   **5.** 6

7. -6 **9.** 14.5   **11.** $\begin{bmatrix} 6 & 7 & -6 \\ -5 & -1 & 5 \end{bmatrix}$ **13.** $18 + 3x$

15. $-15t + 5t^2$ **17.** $11b + 7$ **19.** $5.3y$ **21.** 12   **23.** 24
25. 12   **27.** $1\dfrac{11}{14}$ **29.** 4   **31.** 1   **33.** $y = \dfrac{4}{5}x - \dfrac{13}{5}$ **35.** \$.50/can

37.   **39.**

41. $\dfrac{1}{3}$

43. undefined

45.   **47.**
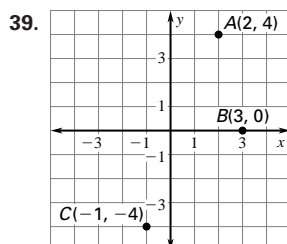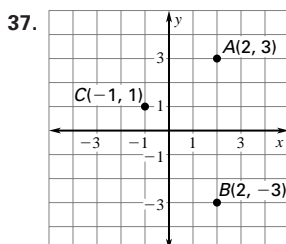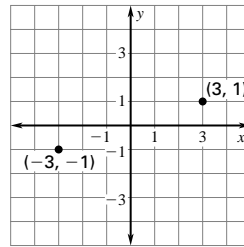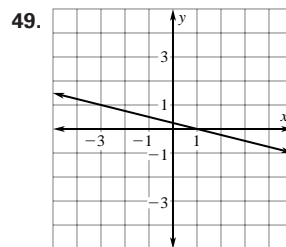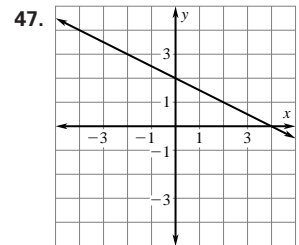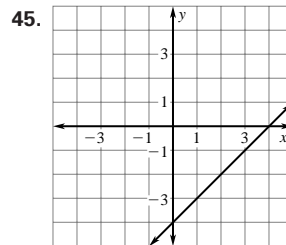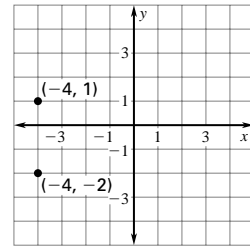
49.   **51.** $y = x - 3$ **53.** $y = 2x + 3$

55. $y = -5x - 9$ **57.** $y = \dfrac{1}{2}x + 3$ **59.** $x < 2$ **61.** $x \le -48$
63. $x < 6$ **65.** $x \ge 10.1$ **67.** $4 < x < 6$ **69.** $x < -2$ or $x > 18$
71. 16, 12.5, 5   **73.** No. *Sample answer:* By estimation, you
have about \$25 – 2(\$10) = \$5 left. The actual amount is
\$25 – 2(\$9.99) = \$5.02, which is less than \$5.95.
75. -100 ft/min, 100 ft/min   **77.** \$9.90   **79.** *Sample answer:*
$y = 365x + 4896$

CHAPTER 7

SKILL REVIEW (p. 396)   **1.** $21x$ **2.** $-36r$ **3.** $-d$ **4.** $\dfrac{5}{4}w$
5. $-\dfrac{16}{21}g$ **6.** $\dfrac{23}{40}y$ **7.** -1 **8.** no solution   **9.** all real numbers
10. $\dfrac{1}{2}$ **11.** solution   **12.** not a solution   **13.** not a solution
14. not a solution

7.1 PRACTICE (pp. 401–403)   **3.** not a solution
5. not a solution   **7.** $-(-4) + (-2) = 2$; $2(-4) + (-2) = -10$;
$(-4, -2)$ is not a solution of either equation.   **9.** $(2, -1)$
11. solution   **13.** not a solution   **15.** not a solution   **17.** $(4, 5)$
19. $(3, 0)$ **21.** $(6, -6)$ **23.** $(-3, -5)$ **25.** $(-4, -5)$
27. $(1, 4)$ **29.** $(-8, -4)$ **31.** $(8, 6)$ **33.** $\left(-1\dfrac{1}{2}, -2\dfrac{1}{2}\right)$
35. 125,000 mi   **37.** *Sample answer:* coastal: $y = 0.12t + 46$;
inland: $y = -0.12t + 54$ **39.** *Sample answer:* 1973

7.1 MIXED REVIEW (p. 403) **47.** -3 **49.** 5 **51.** 9
53. $y = -4x + 12$ **55.** $y = 4x - 9$ **57.** $y = 2x - 1$
59. $x < 4260$
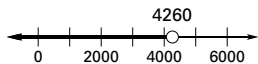
TECHNOLOGY ACTIVITY 7.1 (p. 404) **1.** $(-3.5, 2.5)$
3. $(-1, -2)$ **5.** The lines are parallel. Since the lines do not
intersect, the system has no solution.

7.2 PRACTICE (pp. 408–410) **7.** $(-2, -3)$ **9.** $(1, 2)$ **11.** $(1, 0)$
13. $\left(1\frac{1}{2}, -\frac{1}{2}\right)$ **15.** *Sample answer:* I would isolate m in the
second equation because it is easy to do so and the value is
easy to substitute in the other equation. **17.** $(6, 2)$
19. $(3, 8)$ **21.** $(2, 9)$ **23.** $(5, 15)$ **25.** $(-3, -3)$ **27.** $(12, 17)$
29. $(-168, -108)$ **31.** $(4, 1)$ **33.** $\left(\frac{1}{3}, -4\frac{1}{3}\right)$
35. The variables are eliminated, leaving a statement that is
always true. You solved for one variable in one equation
and substituted for that variable in the same equation;
Substitute $y = -3x + 9$ into Equation 2 to get $(1, 6)$ for the
solution. **37.** $(100, 50)$ **39.** $(7, -6)$ **41.** $(24, -4)$ **43.** 30
11-in. softballs, 50 12-in. softballs
45. $3375 in company EFG, $1125 in company PQR
47. 882 m uphill, 675 m downhill

7.2 MIXED REVIEW (p. 410) **55.** $-2x$ **57.** $26y$
59. $y = 2x + 4$ **61.** $y = -\frac{5}{3}x + 1$
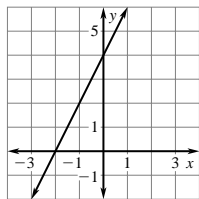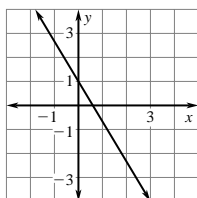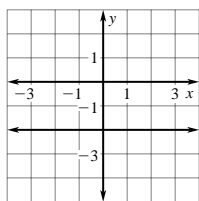
63. $y = -2$ **65.** $-19 \le x \le 9$
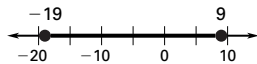
67. $x < -\frac{1}{2}$ or $x > 5\frac{1}{2}$
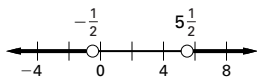
7.3 PRACTICE (pp. 414–416) **5.** *Sample answer:* Multiply
either equation by -1, solve for y, then substitute in either
original equation to solve for x; $(3, 1)$. **7.** *Sample answer:*
Subtract $2x$ from each side of the first equation, solve for y,
then substitute in either original equation to solve for x;
$(3, 2)$. **9.** $(14, 6)$ **11.** $(-1, 1)$ **13.** $(1, 1)$ **15.** $(1, 1)$
17. $(-2, 3)$ **19.** $(3, 2)$ **21.** $(2, 0)$ **23.** $\left(13, \frac{5}{8}\right)$ **25.** $(21, -3)$
27. $(8, -1)$ **29.** $(50, 50)$ **31.** $(1, 2)$ **33.** $(4, 3)$ **35.** $(2, 1)$

37. $(2, 0)$ **39.** $(3, 2)$ **41.** $(0, 4)$ **43.** 5 g **45.** Let $s =$ speed
in still air and $w =$ wind speed; $s - w = 300$, $s + w = 450$.
47. 375 mi/h; 75 mi/h

7.3 MIXED REVIEW (p. 416) **57.** $y = \frac{1}{2}x$ **59.** $y = x - 1$
61. $y = -\frac{1}{3}x + 6$ **63.** solution; not a solution **65.** solution;
not a solution **67.** $(-3, -2)$ **69.** $(10, -2)$ **71.** $(3, 5)$

QUIZ 1 (p. 417) **1.** $(3, -4)$ **2.** $(6, 8)$ **3.** $(0, 0)$ **4.** $(1, 9)$
5. $(-1, 3)$ **6.** $(10, -6)$ **7.** $(5, 1)$ **8.** $\left(-\frac{1}{2}, \frac{1}{2}\right)$ **9.** $\left(2\frac{2}{3}, -6\frac{2}{3}\right)$
10. 4 CDs; 6 CDs

7.4 PRACTICE (pp. 421–424) **3.** *Sample answer:*
Substitution or linear combinations; it would be simple to
write either variable in terms of the other or to eliminate x
by multiplying either equation by -1.
5. *Sample answer:* Any of the three methods would be
reasonable; it would be simple to write either variable in
terms of the other, both would be simple to graph, and y
could be eliminated by multiplying either equation by -1.
7. Let $x =$ price per gallon of regular and $y =$ price per
gallon of premium. **9.** regular: $1.19; premium: $1.39
11. $(3, 2)$ **13.** *Sample answer:* Substitution or linear
combinations; it would be simple to write y in terms of x,
and y could be eliminated by adding the equations.
15. *Sample answer:* Substitution; either variable may be
easily eliminated using one of the equations.
17. *Sample answer:* Linear combinations; no variable has a
coefficient of 1 or -1. **19.** $(2, 1)$ **21.** $(2, -1)$ **23.** $(1, -1)$
25. $(2, -1)$ **27.** $\left(5\frac{5}{9}, 10\right)$ **29.** $(-4, 4)$ **31.** $(3, 0)$ **33.** $(4, 2)$
35. $\left(-\frac{3}{4}, 3\frac{1}{2}\right)$ **37.** $(6, 6)$ **39.** $(6, -5)$ **41.** $(-4, 5)$ **43.** $\left(\frac{1}{3}, 0\right)$
45. $(2, 6)$ **47.** 20 mL of the 5% solution, 40 mL of
the 2% solution **49.** 4 children **51.** $y = 172x + 6200$ and
$y = -16x + 6500$; $\left(1\frac{28}{47}, 6474\frac{22}{47}\right)$; the point of intersection
represents the number of years after 1970 (about 1.6) when
the demand for low-income housing and the availability
were equal (about 6,474,500). **53.** $y = 7x + 50$ **55.** 1 h at
4 mi/h and $\frac{1}{2}$ h at 6 mi/h **57.** substitution, graphing, linear
combinations **59.** No; solving the system involving any
two of the equations will produce the desired solution.
61. $r + b = 12$; $r = 3b$ **63.** 0.75
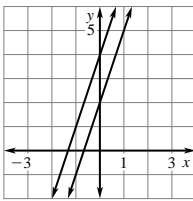
7.4 MIXED REVIEW (p. 424) **67.** parallel **69.** not parallel
71.   **73.**
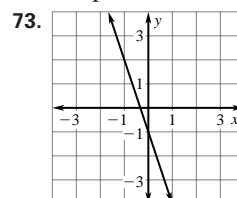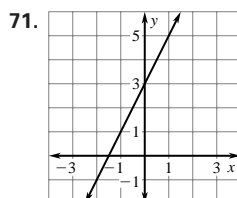
75. 70 out of 100 households
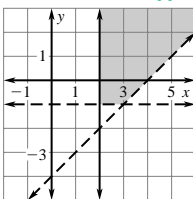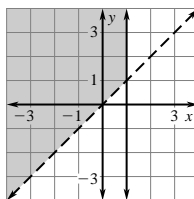
7.5 PRACTICE (pp. 429–431)

7.

no solution   **9.** no solution
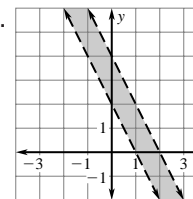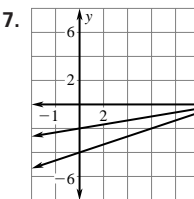
11. exactly one solution, (5, 12)   **13.** D; no solution
15. B; infinitely many solutions   **17.** C; infinitely many
solutions   **19.** infinitely many solutions   **21.** infinitely many
solutions   **23.** no solution   **25.** infinitely many solutions
27. no solution   **29.** no solution   **31.** No; the system of
equations that describes the situation is $4x + 2y = 99.62$,
$12x + 6y = 298.86$, which has infinitely many solutions.
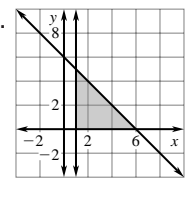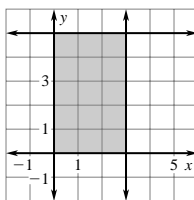
7.5 MIXED REVIEW (p. 431)   **43.** A   **45.** D   **47.** 55 ft/h
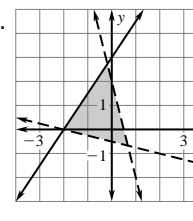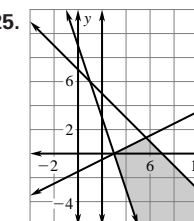
7.6 PRACTICE (pp. 435–437)

5.

7.

9. C   **11.** B   **13.** $y \le \frac{1}{2}x + 2$, $y \ge \frac{1}{2}x - 2$

15.

17.

19.

21.

23.

25.

27. (0, −5), (0, 11), (6, 5)   **29.** (0, 0), (−2, 1), (2, 5)
31. $1 \le x \le 7$, $1 \le y \le 6$

33. $y \le x + 2$, $y \le -x + 7$, $1 \le y \le 3$

35.
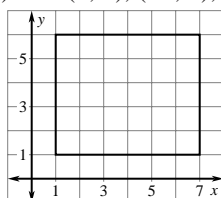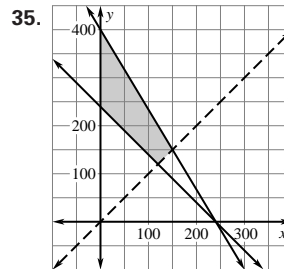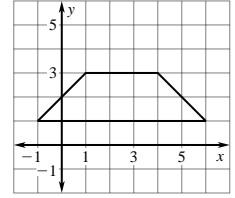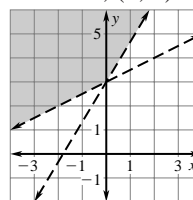
37. 8 square units

39. *Sample answers:* 4 h baby-sitting and 14 h as cashier,
12 h baby-sitting and 6 h as cashier   **41. a.** (0, 0), (0, 2400),
(900, 600), (1050, 0)   **b.** 0; 72,000; 27,000; 10,500
c. $72,000

7.6 MIXED REVIEW (p. 438)   **45.** 243   **47.** 137   **49.** 33
51. 49   **53.** −60   **55.** 9   **57.** 47, 56, 57

QUIZ 2 (p. 438)   **1.** length: 8 ft, width: 3 ft   **2.** no solution
3. no solution   **4.** infinitely many solutions   **5.** exactly one
solution, (5, −6)   **6.** exactly one solution, (0, 1)
7. infinitely many solutions   **8.**

9.

10.

11.

12.

13.
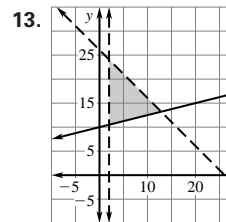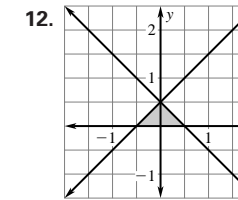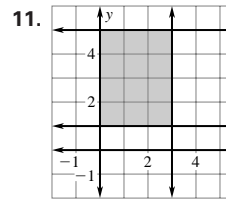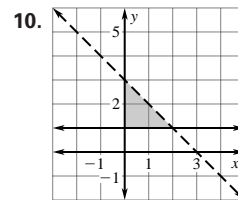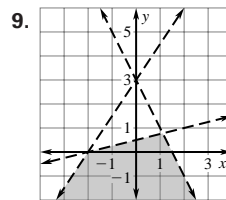
14. $10,000 at 5%, $6000 at 6%

CHAPTER 7 REVIEW (pp. 440–442)

1.

3.

5.
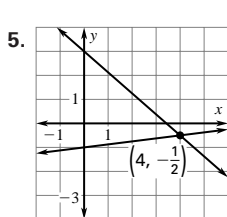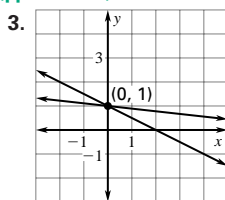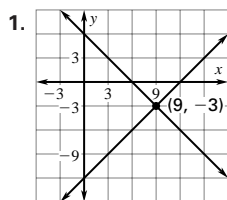
7. $(0, 3)$ **9.** $\left(\dfrac{5}{8}, 1\dfrac{1}{2}\right)$ **11.** $\left(\dfrac{1}{2}, 0\right)$

13. $\left(-5, 2\dfrac{3}{5}\right)$ **15.** $(3, -5)$

17. $(-1, 1)$ **19.** Ferris wheel: 5 times, roller coaster: 7 times

21. infinitely many solutions **23.** exactly one solution, $(2, 6)$

25. exactly one solution, $\left(-3\dfrac{1}{4}, 6\dfrac{1}{2}\right)$

27.

29.

31.
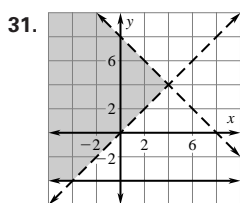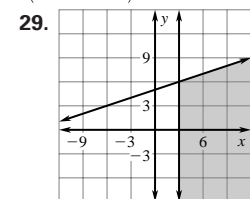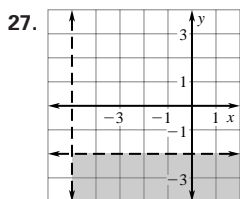
CHAPTER 8

SKILL REVIEW (p. 448) 1. 6^2 **2.** 4^3 **3.** $(2y)^5$ **4.** $\dfrac{1}{4}$ **5.** $\dfrac{1}{9}$

6. $\dfrac{3}{4}$ **7.** $\dfrac{1}{2}$ **8.** \$8.25/h **9.** \$.79/cantaloupe **10.** \$.50/can
11. 45 mi/gal

8.1 PRACTICE (pp. 453–455) 5. m^3 **7.** 3^7, or 2187 **9.** x^9 **11.** 4
13. 4^9, or 262,144 **15.** m^{32} **17.** a^2b^4 **19.** $x^{12}y^{20}$
21. $(-2)^3x^9$, or $-8x^9$ **23.** 5^{11}, or 48,828,125 **25.** 7^8, or
5,764,801 **27.** $3^2 \cdot 7^2$, or 441 **29.** $(-5)^3a^3$, or $-125a^3$
31. $(-4)^6$, or 4096 **33.** $(5 + x)^{18}$ **35.** 3^3b^4, or $27b^4$ **37.** $4x^9$
39. $-3^2 \cdot 7^2 \cdot x^{10}$, or $-441x^{10}$ **41.** $3 \cdot 2^3 \cdot y^5$, or $24y^5$
43. $-r^3s^7$ **45.** $-(-3)^3c^3d^5$, or $27c^3d^5$ **47.** $6^2 \cdot \left(\dfrac{1}{4}\right)^2 \cdot a^{14}$,
or $\dfrac{9}{4}a^{14}$ **49.** -3^2w^7, or $-9w^7$ **51.** $(-x)^9$, or $-x^9$
53. $-r^4s^{14}t^9$ **55.** a^5; 1 **57.** a^6; 1 **59.** a^2b^4; 16 **61.** $-(a^2b^6)$; -64
63. $>$ **65.** $<$ **67.** $>$ **69.** 788.9 **71.** 308.9 **73.** 333,446,267.9
75. approximately $113.04a^3$ **77.** 8 to 1 **79. a.** 2^{30} or

1,073,741,824 ways **b.** $\left(\dfrac{1}{2}\right)^{30}$, or about 0.0000000009

81. 3^{14}; $\dfrac{1}{3^{14}}$, or about 0.0000002

8.1 MIXED REVIEW (p. 455) **87.** 10,000 **89.** $\dfrac{1}{25}$ **91.** $\dfrac{45}{4}$

93.

95.

97.

99.

101.
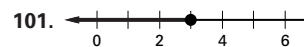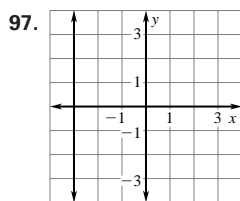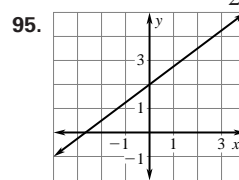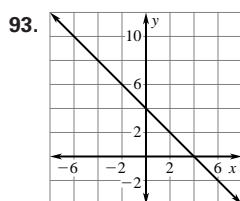
103. $x \geq -\dfrac{10}{3}$

105. \$.07 $\leq p \leq$ \$.71, where p is the price of a quart of milk

8.2 PRACTICE (pp. 459–461) **3.** $\dfrac{1}{3}$ **5.** not defined **7.** $\dfrac{1}{m^2}$

9. $\dfrac{a^5}{b^8}$ **11.** yes **13.** about 26.9 points per game

15. $\dfrac{1}{81}$ **17.** 32 **19.** 100 **21.** $\dfrac{1}{2}$ **23.** 1 **25.** 1 **27.** -9

29. $\dfrac{1}{125}$ **31.** $\dfrac{3}{x^4}$ **33.** $\dfrac{y^4}{x^2}$ **35.** $\dfrac{8}{x^2y^6}$ **37.** $\dfrac{x^{10}}{4y^{14}}$ **39.** $-\dfrac{1}{64x^3}$

41. $\dfrac{1}{9x^2y^2}$ **43.** $8m^2$ **45.** $-\dfrac{1}{2x^3}$ **47.** C **49.** 0.03125

51. 0.00352 **53.** no **55.** no

57.

59.

61.
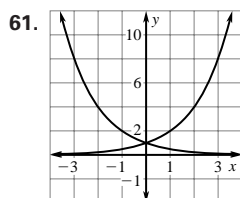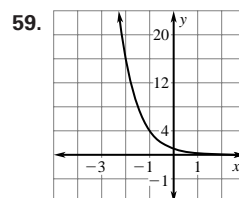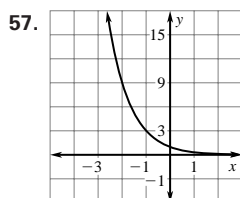
Sample answer: Both graphs are curves that pass through $(0, 1)$ and both increase without limit in one direction and get very close to the x-axis in the other.

63. $(0, 1)$; yes; $(0, 2)$
65. a. 117; 141; 203; 243; 292 **b.**
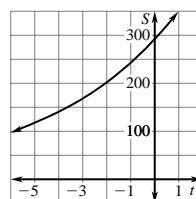
8.2 MIXED REVIEW (p. 461) **71.** $\dfrac{4}{25}$ **73.** $-\dfrac{729}{1000}$

75. $-12 \leq x \leq 2$

77. $-11 \leq x \leq 7$

79. $4 < x < 5$

81.

83. $\left(\frac{1}{2}, 3\right)$
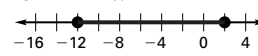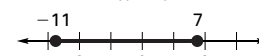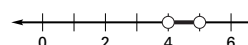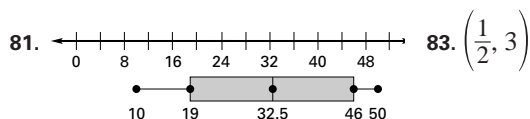
85. $(100, 50)$ **87.** $(-129, 9)$

TECHNOLOGY ACTIVITY 8.2 (p. 462) **7.** *Sample answer:*
The graph is close to the negative *x*-axis and curves
upward to the right. **9.** *Sample answer:* The graph is close
to the negative *x*-axis and curves downward to the right.

8.3 PRACTICE (pp. 466–468) **3.** 125 **5.** a^3 **7.** a^3 **9.** $\frac{1}{5}$

11. $\frac{1}{32}$ **13.** $\frac{25}{m^2}$ **15.** $\frac{64}{125}$ **17.** $\frac{x^{18}}{y^{30}}$ **19.** 125 **21.** -1

23. 2187 **25.** $\frac{1}{125}$ **27.** 27 **29.** $\frac{9}{25}$ **31.** $\frac{81}{x^4}$ **33.** $\frac{1}{x^5}$ **35.** $\frac{1}{x^3}$

37. y^2 **39.** $\frac{1}{r^{12}}$ **41.** $\frac{8x^6 y^9}{27}$ **43.** $5x^3 y^3$ **45.** $\frac{x^6}{256y^8}$

47. $\frac{5}{4x^{11} y^4}$ **49.** $\frac{6^3}{6} = 6^{3-1} = 6^2 = 36$ **51.** The volume of

Earth is about 64 times the volume of the Moon.

53. $\frac{1}{1.2^6} \approx \frac{1}{3}$ **55.** about 3 times **57.** $\frac{1}{1.13^2}$ or about 0.8

59. a. 200; 160; 128; 102; 82; 66; 52 **61.** $\left(\frac{1}{2}\right)^6 \approx 0.02$

8.3 MIXED REVIEW (p. 469) **67.** $100,000$ **69.** $\frac{1}{10,000}$

71. **73.**

75. **77.**
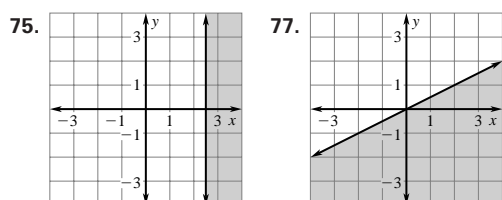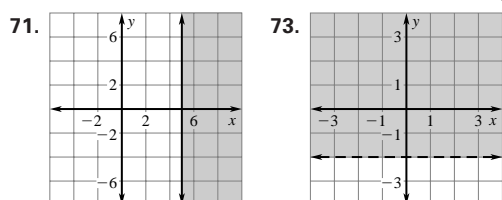
79. solution **81.** solution **83.** $(8, 4)$ **85.** $(4, 3)$

QUIZ 1 (p. 469) **1.** 2187 **2.** 256 **3.** $10,000$ **4.** $\frac{1}{2401}$

5. $\frac{1}{16,384}$ **6.** $\frac{7}{6}$ **7.** $\frac{1}{3125}$ **8.** 2187 **9.** $\frac{64}{125}$ **10.** -128 **11.** 64

12. 4 **13.** x^9 **14.** $-32x^5$ **15.** $-3a^5$ **16.** c^5 **17.** x^2 **18.** x

19. $\frac{16m^4}{81n^4}$ **20.** x **21.** $-1728a^6$ **22.** $16m^{10}$ **23.** $30x^2$

24. $145.87; \$214.33; \$250$

8.4 PRACTICE (pp. 473–475) **3.** 430 **5.** 0.245 **7.** 3.96×10
9. 1.2×10^3 **11.** 6.9×10^6 **13.** 7.2×10^7
15. approximately 1.97×10^4 sec, or about 5.5 h **17.** 0.98
19. 8652.1 **21.** 0.000006002 **23.** $100,012,000$ **25.** 5×10^{-2}
27. 4.22×10^{-2} **29.** 7×10^8 **31.** 8.551×10^{-3}
33. 4.59×10^{-4} **35.** 8.8×10^7 **37.** 1.2×10^5; $120,000$
39. 1.5×10^5; $150,000$ **41.** 1.6×10^2; 160 **43.** 6.0×10^0;
6 **45.** 8.1×10^7; $81,000,000$ **47.** 2.4×10^{10};
$24,000,000,000$ **49.** 1.09926×10^6; $1,099,260$
51. 5.76×10^{-8}; 0.0000000576 **53.** 1.2×10^8
55. 5.0819×10^{13} **57.** about 3.57×10^{14} mi^3
59. Louisiana Purchase: $.03/acre; Gadsden Purchase:
$.53/acre **61.** 4.4064×10^{10} m^3 **63.** Answers are rounded
to the nearest whole number; TX: 2167; MN: 1522;
PA; 1583; VT: 810; CA: 1806

8.4 MIXED REVIEW (p. 475) **67.** 0.22 **69.** 0.0007
71. 0.005 **73.** 2.55 **75.** $(1, 4)$

77. **79.**
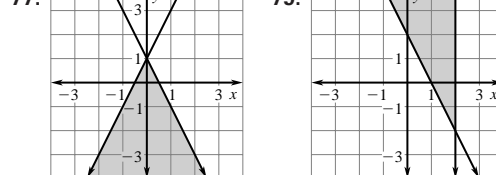
81. 1000 **83.** $\frac{1}{49}$

8.5 PRACTICE (pp. 480–482) **5.** B **7.** 2231.39 **9.** 4489.99
11. 379.25 **13.** 505.67 **15.** 325.40
17. about 46.3 L/min; about 86.5 L/min **19.** A
21. $P = 10,000(1.25)^t$

23.
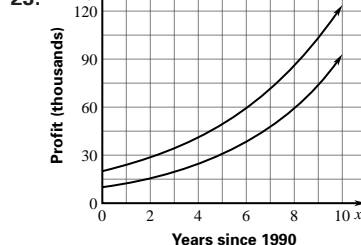
Sample answer: I would
base my choice on how
long I thought I would
own the business (and
how realistic I thought
the continued annual
increase was). The
profits for the business
in Ex. 22 started higher
than those for the other business and would remain higher
for 16 years. After that, the profits of the other business
would increase more rapidly and be much higher. For
example, after 20 years the profits would be more than
$100,000 greater. **25.** B

8.5 MIXED REVIEW (p. 482) **33.** 176.25 **35.** 260 **37.** 0.96
39. $-\frac{16}{15}$ **41.** -0.29999952 **43.** 0.41405 **45.** 2.4 **47.** 3

8.6 PRACTICE (pp. 488–490) **5.** 5137 **7.** 3770 **9.** C
11. 5450 **13.** 2845 **15.** B **17.** exponential growth;
1.18; 18% **19.** exponential growth; $\frac{5}{4}$; 25%
21. exponential decay; $\frac{2}{5}$; 60% **23.** 160 mg **25.** 246 mg

27. $N = 64\left(\dfrac{1}{2}\right)^t$ **31.** $M = 302(0.9)^t$

33.
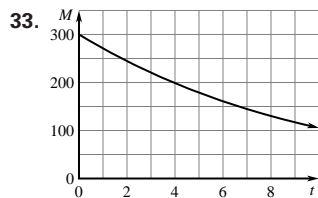
8.6 MIXED REVIEW (p. 490) 41. 20 **43.** 7 **45.** -1.3 **47.** 2.4

QUIZ 2 (p. 491) 1. 1.1205×10^{-2} **2.** 1.4×10^8
3. 6.7×10^{-8} **4.** 3.072×10^{10} **5.** 4820 **6.** $5,000,000,000$
7. 0.00000704 **8.** 0.01112 **9.** $y = 50(1.05)^t$; about $70
10. $y = 20,000(0.85)^t$; about $8874

TECHNOLOGY ACTIVITY 8.6 (p. 492)
1. $y = 1.0339(1.6293)^x$

CHAPTER 8 REVIEW (pp. 494–496) 1. 2^9, or 512
3. $3^3 \cdot 2^2 \cdot a^5$, or $108a^5$

5. s^7; 128 **7.** $s^6 t^2$; 576 **9.** $\dfrac{1}{125}$ **11.** 32 **13.** $\dfrac{x^6}{y^6}$ **15.** 1

17.

19.
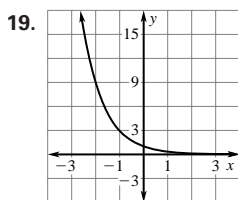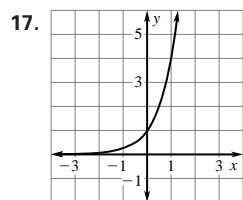
21. $\dfrac{1}{27}$ **23.** $\dfrac{16}{81}$ **25.** $\dfrac{531,441}{b^6}$ **27.** m^6 **29.** $-27a^3 b^3$

31. $-24a^2 b^2$ **33.** $\dfrac{1}{1.17^5} \approx 0.46$ **35.** $768,000$ **37.** 0.0002

39. 6.79×10^{-4} **41.** 7.52×10^7 **43.** $w = 2(1.05)^x$
45. $e = 125(0.97)^x$

CHAPTER 9

SKILL REVIEW (p. 502) 1. -60 **2.** 12 **3.** 44 **4.** 2

5.

6.

7.
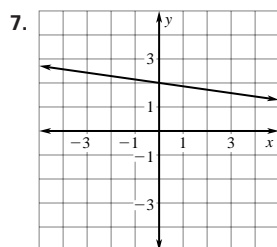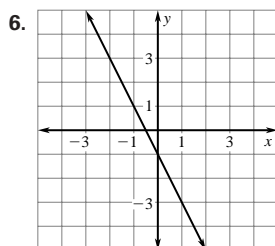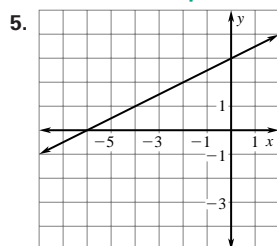
8. not a solution **9.** solution
10. solution

9.1 PRACTICE (pp. 507–509) 9. 0.9 **11.** ± 3 **13.** $3, 7$
15. $-2, 2$ **17.** $-1.2, 1.2$ **19.** about 1.7 sec **21.** about 3.5 sec
23. $-7, 7$ **25.** no square roots **27.** 0 **29.** $-0.3, 0.3$
31. -13 **33.** 3.61 **35.** 0.2 **37.** -0.32 **39.** 3 **41.** undefined
43. $\sqrt{109}$ **45.** $-2.27, 4.27$ **47.** $-1.33, 2.13$ **49.** -11.24,
-2.76 **51.** $-1.80, 5.13$ **53.** $-1.34, -0.99$ **55.** $-8, 8$
57. $-4, 4$ **59.** no solution **61.** $-3, 3$ **63.** $-4, 4$
65. no solution **67.** $-3, 3$ **69.** $-3.87, 3.87$ **71.** $-2.65, 2.65$
73. no solution **75.** $-2.83, 2.83$ **77.** $-1.41, 1.41$
79. $h = -16t^2 + 60$ **81.** $\sqrt{3.75} \approx 1.94$ sec **83.** 3 sec
85. 5 sec **87.** 2003 **89.** 0.40 mm **91.** 0.15 mm
93. 0.12 mm

9.1 MIXED REVIEW (p. 510) 101. 11 **103.** $2^3 \times 3^2$
105. $(-1, -2)$ **107.** $(-48, 14)$ **109.** $(-4, -19)$
111. 1225 student tickets, 1117 general admission tickets

9.2 PRACTICE (pp. 514–515) 5. A **7.** C **9.** *Sample answer:*
The factor 5 cannot be taken outside the radicand. The first
step should be $\sqrt{50} = \sqrt{25 \cdot 2}$. Then, by the product
property, this equals $\sqrt{25} \cdot \sqrt{2}$, or $5\sqrt{2}$. **11.** $3\sqrt{3}$

13. $5\sqrt{3}$ **15.** $5\sqrt{5}$ **17.** $4\sqrt{5}$ **19.** $\sqrt{6}$ **21.** $4\sqrt{3}$ **23.** $\dfrac{\sqrt{11}}{4}$

25. $2\sqrt{5}$ **27.** $3\sqrt{3}$ **29.** $\dfrac{3\sqrt{2}}{4}$ **31.** $\dfrac{3\sqrt{3}}{4}$ **33.** $8\sqrt{5}$ **35.** $\dfrac{\sqrt{3}}{2}$

37. 2 **39.** $\dfrac{4\sqrt{3}}{9}$ **41.** $\sqrt{30}$ **43.** $18\sqrt{7}$ **45.** -18 **47.** -3

49. $\dfrac{-2\sqrt{5}}{5}$ **51.** $\dfrac{1}{4}$; 0.25 **53.** $\dfrac{\sqrt{15}}{2} \approx 1.94$ m^2 **55.** $70\sqrt{2}$ m/sec

9.2 MIXED REVIEW (p. 516)

65.

67.
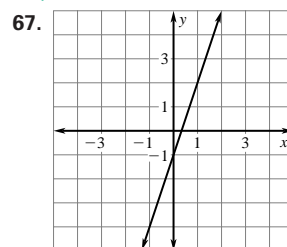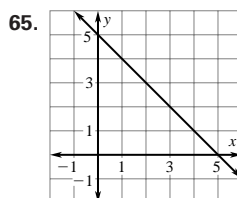
69. b^8; 256 **71.** $\dfrac{x^5}{2}$ **73.** $\dfrac{y^3}{x^4}$ **75.** $(1.3)^4 \approx 2.86$

9.3 PRACTICE (pp. 521–523) 5. up; $x = -2$ **7.** up; $x = -\dfrac{7}{2}$

9. up; $x = \dfrac{1}{5}$ **11.** $(0, 0)$
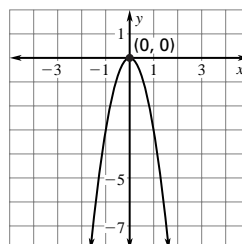
13. $(0, 10)$
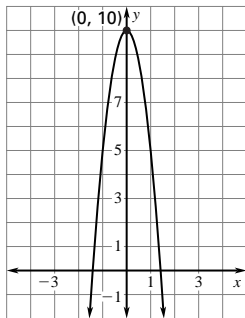
15. $(3, -1)$
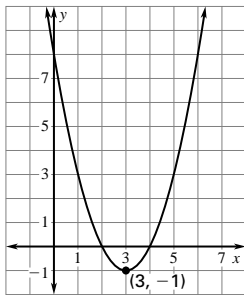
17. $\left(-\dfrac{1}{2}, 13\right)$ **19.** $(2, -5)$
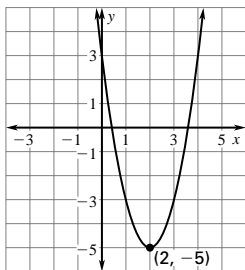
21. a. up   **b.** $(0, 0)$ **c.** $x = 0$ **23. a.** up   **b.** $(0, 0)$ **c.** $x = 0$
25. a. down   **b.** $(0, 0)$ **c.** $x = 0$ **27. a.** down   **b.** $(0, 0)$ **c.** $x = 0$
29. a. up   **b.** $\left(2\dfrac{1}{2}, -12\dfrac{1}{2}\right)$ **c.** $x = 2\dfrac{1}{2}$ **31. a.** down
b. $\left(\dfrac{3}{5}, 3\dfrac{3}{5}\right)$ **c.** $x = \dfrac{3}{5}$ **33. a.** up   **b.** $(-1, 2)$ **c.** $x = -1$
35. a. up   **b.** $\left(1\dfrac{3}{4}, -14\dfrac{1}{8}\right)$ **c.** $x = 1\dfrac{3}{4}$ **37. a.** down   **b.** $(4, 48)$
c. $x = 4$ **39. a.** up   **b.** $\left(-\dfrac{1}{32}, -8\dfrac{1}{256}\right)$ **c.** $x = -\dfrac{1}{23}$
41. a. up   **b.** $(2.56, -13.1)$ **c.** $x = 2.56$ **43. a.** down
b. $(-0.35, 3.885)$ **c.** $x = -0.35$

45. $(0, 0)$
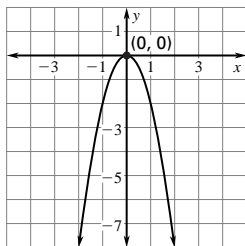
47. $(-2, -5)$
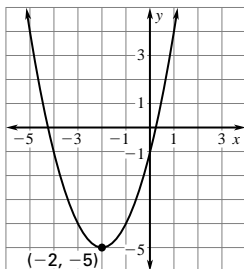
49. $(-1, -7)$
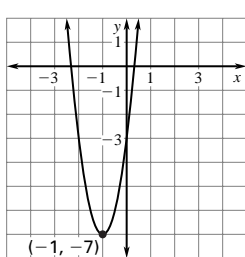
51. $\left(\dfrac{1}{3}, -\dfrac{2}{3}\right)$
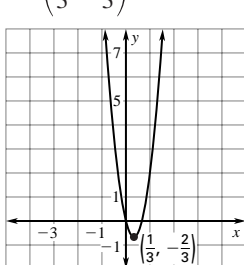
53. $\left(-\dfrac{1}{2}, \dfrac{15}{4}\right)$ **55.** $\left(\dfrac{1}{3}, -\dfrac{4}{3}\right)$ **57.** $\left(-\dfrac{1}{3}, -\dfrac{2}{3}\right)$ **59.** $\left(\dfrac{1}{2}, 8\right)$

61. $\left(\dfrac{3}{2}, -\dfrac{1}{2}\right)$
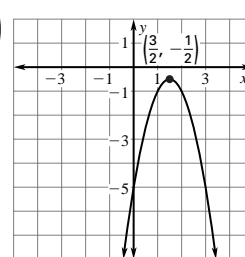
63. $(-4, 14)$

65. 5 ft   **67.** 70 ft   **69.** 1980 to 1984   **71.** The vertex is the point at which the graph changes direction, that is, when the values of G stop decreasing and begin increasing.
73. about 0.21 sec

9.3 MIXED REVIEW (p. 524)

81. $y = 3x - 6$
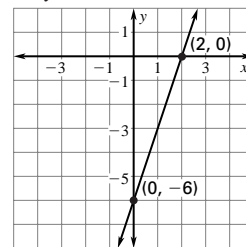
83. $y = -2x + 6$
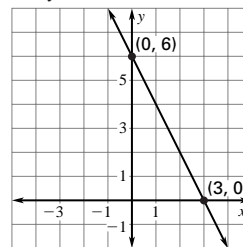
85.
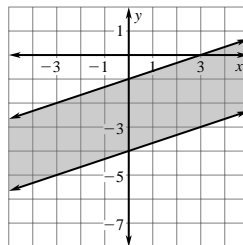
87.
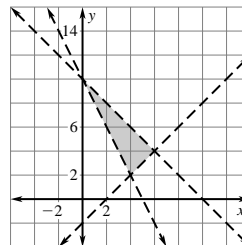
89. 3^6, or 729   **91.** a^6 **93.** $216x^3$ **95.** $-27a^6b^6$
97. 9.87×10^5 **99.** 1.229×10^9 **101.** 9.99×10^{-3}

QUIZ 1 (p. 524)   **1.** 12   **2.** -14 **3.** -26 **4.** -5.20 **5.** 2.45
6. 1.22   **7.** 0.4   **8.** 1.5   **9.** $-13, 13$ **10.** $-4, 4$
11. $-\sqrt{10}, \sqrt{10}$ **12.** $-2\sqrt{2}, 2\sqrt{2}$ **13.** $3\sqrt{2}$ **14.** 10   **15.** 11
16. $\dfrac{\sqrt{5}}{2}$ **17.** up; $(-1, -12)$; $x = -1$ **18.** up; $(2, -14)$; $x = 2$

19. up; $(-1, -13)$; $x = -1$ **20.** up; $\left(-5, -15\dfrac{1}{2}\right)$; $x = -5$

21. up; $\left(\dfrac{1}{2}, 5\dfrac{1}{4}\right)$; $x = \dfrac{1}{2}$ **22.** up; $\left(-4\dfrac{1}{2}, -20\dfrac{1}{4}\right)$; $x = -4\dfrac{1}{2}$

23.

24.

25.

Graph showing parabola with vertex $\left(\frac{1}{4}, -\frac{23}{8}\right)$
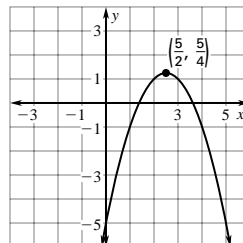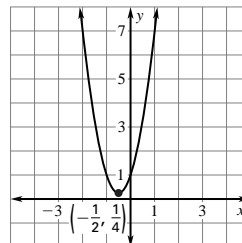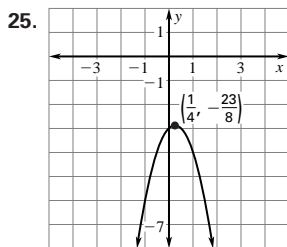
TECHNOLOGY ACTIVITY 9.3 (p. 525)
1. $y = 5.25x^2 + 67.21x - 81.46$

9.4 PRACTICE (pp. 529–530)
7. $-2, 2$ **9.** $-3, 3$ **11.** $-3, 3$
13. $-3, 3$ **15.** $-2, -1$ **17.** $-4, 5$ **19.** $-4.2, 0.2$ **21.** $-4, 4$
23. $-5, 5$ **25.** $-12, 12$ **27.** $-5, 5$ **29.** $-4, 4$ **31.** $-9, 9$
33. $-2, 3$ **35.** $-1, 2$ **37.** $-3, 1$ **39.** $-1, 5$ **41.** $-7, 3$
43. $-2, -1$ **45.** $-1, 4$ **47.** $-1.17, 0.17$ **49.** $-8, 4$
51. 69.19 ft; the distance was greater than that for an initial angle of 65°, but less than that for an initial angle of 35°.
53.
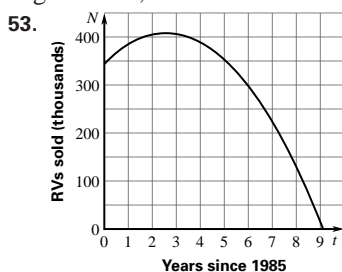
55. 1994

9.4 MIXED REVIEW (p. 531)
65. $\left(-\frac{5}{2}, \frac{3}{4}\right)$; one solution
67. infinitely many solutions **69.** no solution
71. $-1.17, 6.17$ **73.** $-1.47, 7.47$ **75.** $2\sqrt{10}$ **77.** $2\sqrt{15}$
79. $2\sqrt{5}$ **81.** $\frac{1}{2}\sqrt{2}$ **83.** pasta dishes: \$5.95, salads: \$1.95

TECHNOLOGY ACTIVITY 9.4 (p. 532)
1. $0.26, 6.41$ **3.** $0.21, 4.79$ **5.** $1.71, 2$ **7.** $3.04, 6.40$

9.5 PRACTICE (pp. 536–537)
5. $5, -3$ **7.** $0.5, 1.5$
9. $-3 + 2\sqrt{3}, -3 - 2\sqrt{3}$ **11.** $8x^2 + 6x - 2 = 0; -1, \frac{1}{4}$
13. $2x^2 - 14x - 36 = 0; -2, 9$ **15.** $4x^2 + 4x + 1 = 0; -0.5$
17. $-2, -8$ **19.** $\frac{-3 + 3\sqrt{3}}{2} \approx 1.10, \frac{-3 - 3\sqrt{3}}{2} \approx -4.10$
21. $\frac{-2 + \sqrt{5}}{2} \approx 0.12, \frac{-2 - \sqrt{5}}{2} \approx -2.12$ **23.** 25 **25.** 1 **27.** 1
29. 21 **31.** 39 **33.** $-10, -1$ **35.** $-\frac{4}{3}, 2$
37. $\frac{-7 + \sqrt{22}}{9} \approx -0.26, \frac{-7 - \sqrt{22}}{9} \approx -1.30$
39. $\frac{-1 + 2\sqrt{2}}{7} \approx 0.26, \frac{-1 - 2\sqrt{2}}{7} \approx -0.55$
41. $6 + \sqrt{62} \approx 13.87, 6 - \sqrt{62} \approx -1.87$
43. $\frac{5 + \sqrt{177}}{-4} \approx -4.58, \frac{5 - \sqrt{177}}{-4} \approx 2.08$

45. $x^2 - 3x + 2 = 0; 1, 2$ **47.** $6x^2 + 5x - 1 = 0; -1, \frac{1}{6}$
49. $2z^2 - 5z - 7 = 0; -1, \frac{7}{2}$ **51.** $5c^2 - 9c + 4 = 0; \frac{4}{5}, 1$
53. $4, -2$ **55.** $-2, 3$ **57.** $-2.56, 1.56$ **59.** $-1, \frac{1}{3}$
61. $-0.62, 1.62$ **63–69 odd**: Sample answers are given.
All the equations can be solved using the quadratic formula.
63. $4\sqrt{2} \approx 5.66, -4\sqrt{2} \approx -5.66$; finding square roots;
simplest method **65.** $-\frac{7}{2}, \frac{7}{2}$; finding square roots;
simplest method **67.** -9; finding square roots;
the expression on the left can be written $(h + 9)^2$.
69. $\frac{1 + \sqrt{5}}{6} \approx 0.54, \frac{1 - \sqrt{5}}{6} \approx -0.21$; quadratic formula;
when written in standard form, the expression cannot be written as a perfect square. **71.** 2.30 sec **73.** 2.21 sec
75. 1.31 sec **77.** 1.37 sec **79.** 5.70 sec **81.** 0.44 sec
83. 0.79 sec

9.5 MIXED REVIEW (p. 538)
87. 25 **89.** -48 **91.**

93. $-3 < x < 5$
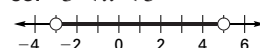
95. $x \le -15$ or $x \ge 5$
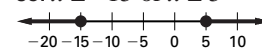
97. $\left(\frac{1}{3}, -\frac{5}{3}\right)$ **99.** $\left(-\frac{3}{4}, \frac{25}{8}\right)$
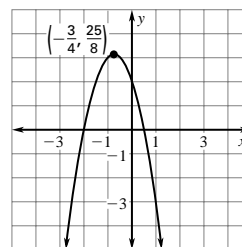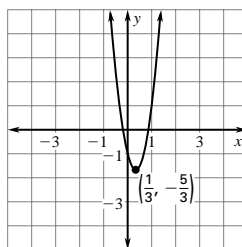
101. $\left(\frac{1}{32}, 3\frac{255}{256}\right)$
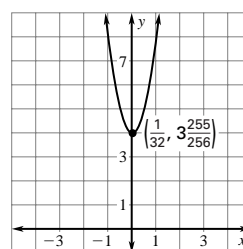
103. about 3.84×10^4 people; about 1.17×10^6 people

TECHNOLOGY ACTIVITY 9.5 (p. 539) **1.** $-6, 5$ **3.** -2
5. no solution **7.** $-2.4, 1$ **9.** $-6.35, -2.16$

9.6 PRACTICE (pp. 544–545)
3. -56; no real solution **5.** 65; two solutions **7.** A **9.** two solutions **11.** two solutions
13. no real solution **15.** one x-intercept; B **17.** no x-intercept; A **19.** two solutions **21.** The equation has two solutions for all values of c less than 4, one solution for $c = 4$, and no real solution for all values of c greater than 4.

23. The equation has two solutions for all values of c less than $1\frac{1}{8}$, one solution for $c = 1\frac{1}{8}$, and no real solution for all values of c greater than $1\frac{1}{8}$.

25. Yes; no; *Sample answer:* Because the discriminant for you is positive, your equation has two solutions; because the discriminant for your friend is negative, your friend's equation has no real solution. That is, there is no time when your friend's jump height will be 3.4 ft.

27. *Sample answer:* The payroll will reach \$80 billion if the discriminant of the equation $26t^2 + 1629t - 60{,}042 = 0$ is nonnegative; since the discriminant is 8,898,009, the payroll will reach that amount. **29.** yes

9.6 MIXED REVIEW (p. 546)

35.

37.

39. $x \le -45$ **41.** $x \le 12$

43.

45.

47.

Modem Prices
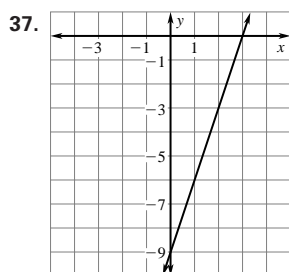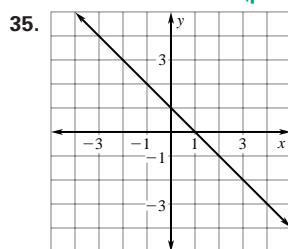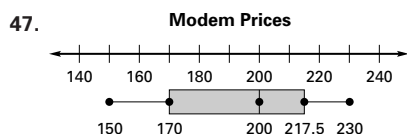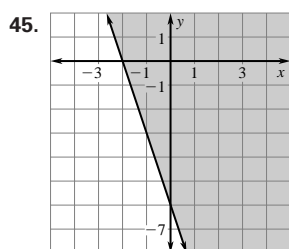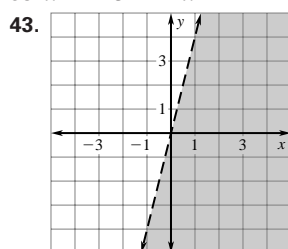
QUIZ 2 (p. 547) **1.** $-2, 5$ **2.** 6 **3.** $-3, -1$ **4.** -3
5. $-6, -0.5$ **6.** $-2, 8$ **7.** $1.5, 2$ **8.** $-3, 1\frac{1}{3}$ **9.** $-1, -0.6$
10. two solutions **11.** one solution **12.** no real solution
13. Yes; *Sample answer:* The discriminant of the equation $-16t^2 + 50t + 6 = 45$ is positive, so the equation has two real solutions, meaning that the ball would reach a height of 45 ft.

9.7 PRACTICE (pp. 551–552) **5.** $(1, -2)$ is not a solution; $(0, 0)$ is a solution. **7.**

9.

11.
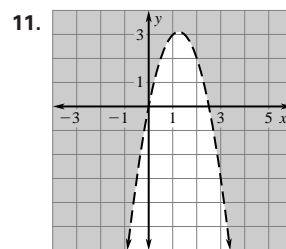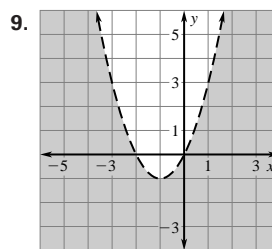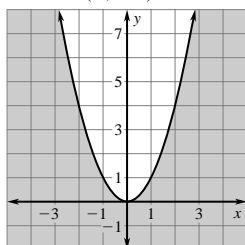
13. solution **15.** not a solution **17.** C **19.** E **21.** D

23.

25.

29.

33.
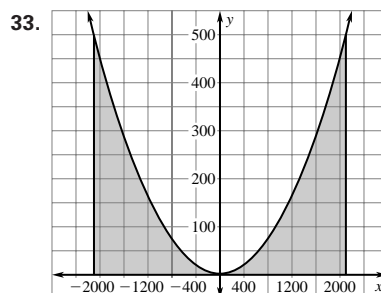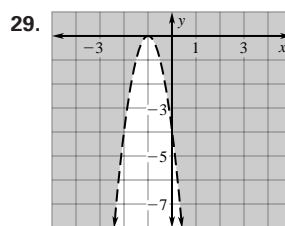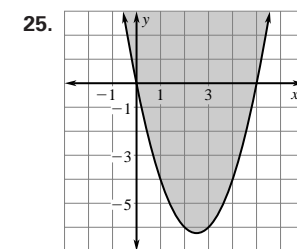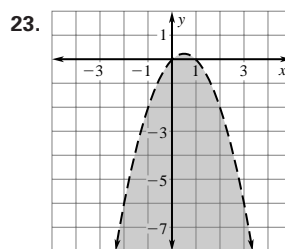
35. I3; for every value of x, the value of y (that is, the cost of the diamond) is lower for that grade than for either of the others.

37. A; VS2

9.7 MIXED REVIEW (p. 553)

45.

47.

49.
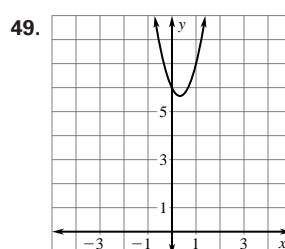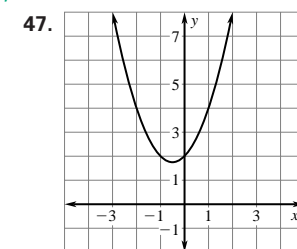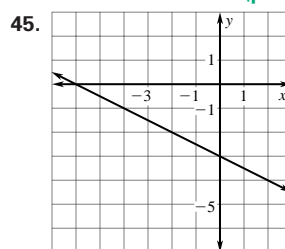
51. $y = -\frac{1}{6}x$ **53.** $y = 4x$

55. $y = \frac{6}{23}x$ **57.**

59.

61.
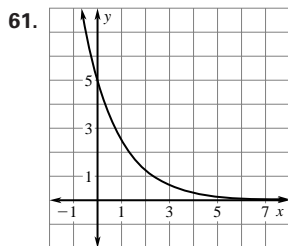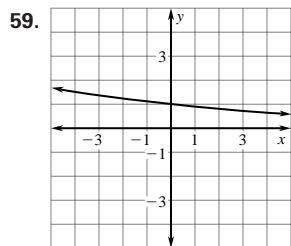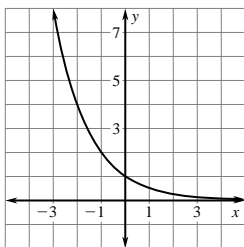
63. 1, 2   **65.** $\dfrac{9 + \sqrt{105}}{-4} \approx -4.81$, $\dfrac{9 - \sqrt{105}}{-4} \approx 0.31$

67. $\dfrac{-2 + \sqrt{10}}{2} \approx 0.58$, $\dfrac{-2 - \sqrt{10}}{2} \approx -2.58$

9.8 PRACTICE (pp. 557–559)   **3.** quadratic   **5.** linear
7. Quadratic; the graph is a curve but the ratios of consecutive *y*-coordinates are not the same.

9.

quadratic

11.
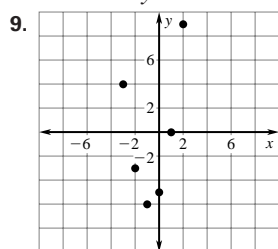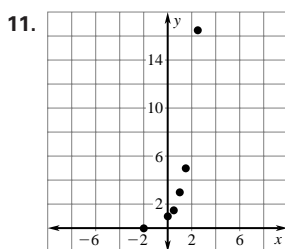
exponential

13. exponential   **15.** quadratic

17.
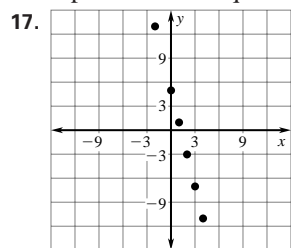
linear   **19.** linear; $B = 0.43w$

21.

23. $y = -2x + 9$; -2 **25.** (4, 1)

9.8 MIXED REVIEW (p. 560)   **33.** -3, x **35.** -5, $-8x$
37. $-5y^2$ **39.** $2r^3$ **41.** $-y^3$ **43.** 0.73   **45.** -0.41
47. $y = 3x - 11$ **49.** $y = -\frac{1}{2}x + 4$

QUIZ 3 (p. 560)   **1.** not a solution   **2.** solution   **3.** solution
4. solution   **5.** B   **6.** C   **7.** A
8.

linear

9.

exponential

10.

quadratic

11.

linear; $y = -2x + 3$

12.
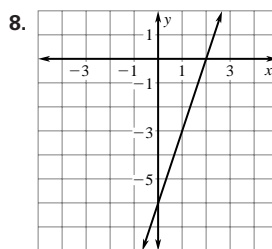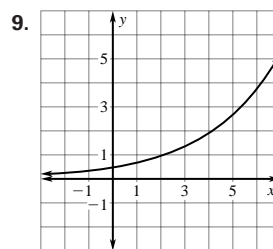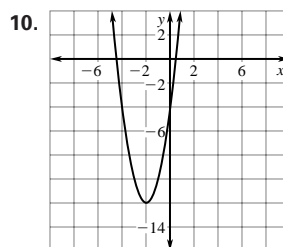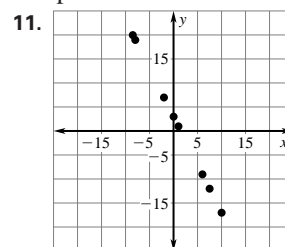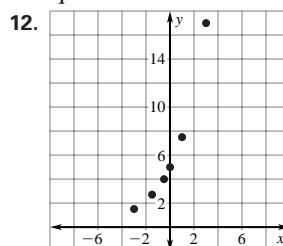
exponential; $y = 5(1.5)^x$

13.
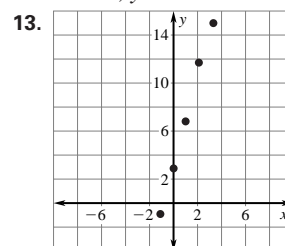
linear; $y = 3.72x + 3.16$

CHAPTER 9 REVIEW (pp. 562–564)
1. -12, 12   **3.** 0   **5.** -5, 5   **7.** $3\sqrt{5}$ **9.** $\frac{3}{4}$

11.

13.
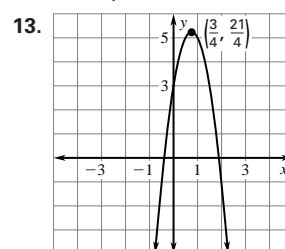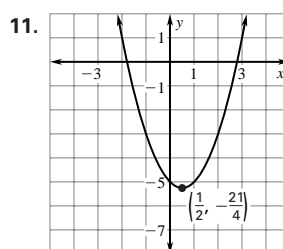
15. -3, 5   **17.** -6, 4   **19.** $-\frac{3}{2}$, 2   **21.** one solution
23. no real solution   **25.**

27.

quadratic

29.
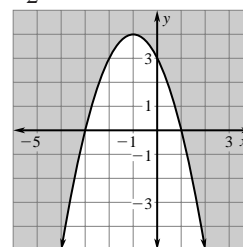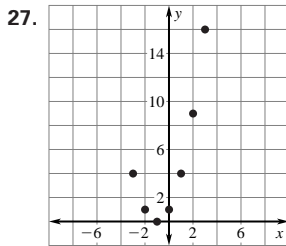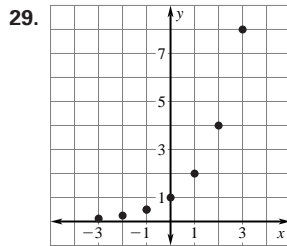
exponential

CUMULATIVE PRACTICE (pp. 568–569) **1.** Yes; no input value has two different output values. **3.** Yes; no input value has two different output values. **5.** $\frac{2}{9} \approx 22\%$; 2 to 7 **7.** *Sample equation:* $\frac{x}{35} = \frac{6}{15}$; 14 in. **9.** 4 **11.** 2 **13.** 6 **15.** $2x - 6y = -4$ **17.** 5, 7, 8 **19.** 4, 4, 8 **21.** $\left(14, -3\frac{1}{2}\right)$ **23.** $(-5, -3)$ **25.** $(6.8, -3.7)$

27.

29.
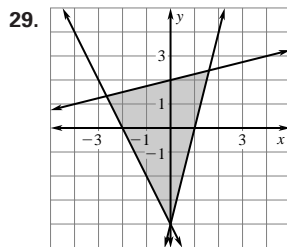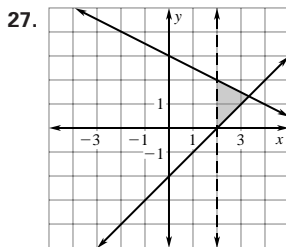
31. $\frac{1}{x^2}$ **33.** $\frac{4x^4}{y^{10}}$ **35.** $9a^{12}$ **37.** $5x^5y^4$ **39.** $4.2 \times 10^{-8} = 0.000000042$ **41.** $2.92 \times 10^{-12} = 0.00000000000292$ **43.** $2.1952 \times 10^{-5} = 0.000021952$ **45.** B **47.** A **49.** $\frac{\sqrt{7}}{3}$ **51.** $\frac{4\sqrt{7}}{7}$ **53.** $\sqrt{3}$ **55.** 15 **59.** $-9, -1$

61. $\frac{-4 - \sqrt{31}}{3} \approx -3.19, \frac{-4 + \sqrt{31}}{3} \approx 0.52$

63. 1, 5 **65.** $10.31; $26.28 **67.** No; the discriminant of the equation $-16t^2 + 100t = 180$ is negative, so the equation has no real solution. That is, there is no time t at which the flare will reach a height of 180 ft.

CHAPTER 10

SKILL REVIEW (p. 574) **1.** $3x^2 + 18x$ **2.** $14 - 28x$ **3.** $-4x - 20$ **4.** $-64 + 16x$ **5.** $3x - 6$ **6.** $2x + 3$ **7.** $-2x - 4$ **8.** $x^2 - x$ **9.** x^{10} **10.** x^{12} **11.** $-8a^3b^3$ **12.** $9x^4y^8$ **13.** -56; no real solution **14.** 196; two solutions **15.** 0; one solution

10.1 PRACTICE (pp. 579–581) **7.** linear, binomial **9.** cubic, trinomial **11.** constant, monomial **13.** $4x^2 - 7x - 2$ **15.** $-4x^2 + 9x + 4$ **17.** $-x^2 - x - 16$ **19.** -3; linear, binomial **21.** 1; cubic, polynomial **23.** -6; constant, monomial **25.** 5; quartic, trinomial **27.** -4; quartic, polynomial **29.** -16; cubic, monomial **31.** $-6x^3 + 3x^2 + 4$ **33.** $-7m^2 + 7m - 3$ **35.** -6 **37.** $8y^3 + 6y^2 - 3y - 3$ **39.** $3x^2 - 5$ **41.** $x^3 + 1$ **43.** $2n^3 + 3n - 5$ **45.** $10b^4 - 3b^3 - 13b^2 + 20b - 4$ **47.** $25x^3 - 4x + 14$ **49.** $x^2 + 2x + 2$ **51.** $-3x^2 + 6$ **53.** $-9z^3 - 8z^2 + 10z$ **55.** $-19t + 2$ **57.** $x^4 + x^3 + \frac{1}{12}x^2 - 9$

59. $9x^4 - 3x^3 - 7x^2 + 6x - 17$ **61.** $-0.7y^3 + 6.9y^2 - 3.9y + 10.4$ **63.** $1.5x^2 + 60x$ **65.** $F = 1223.58t + 79,589.03$ **67.** $A = 1.381t^2 + 3.494t + 235.325$ **69.** From top to bottom the models are *A, E,* and *N.*

10.1 MIXED REVIEW (p. 582) **73.** $-3x - 5$ **75.** $8x + 24$ **77.** $3 + 4x$ **79.** *Sample answer:* $y = -1.42x + 7.35$ **81.** 2^{16}; 65,536 **83.** $(1.1^3)(3.3^3)$; 47.83 **85.** 2.9^{15}; 8,629,188.75

TECHNOLOGY ACTIVITY 10.1 (p. 583) **1.** correct **3.** $3x^2 - 9x$ **5.** $-2x^2 + 14x + 4$ **7.** $6x^2 + 12x - 1$

10.2 PRACTICE (pp. 587–588) **5.** $8x^2 + 14x + 3$
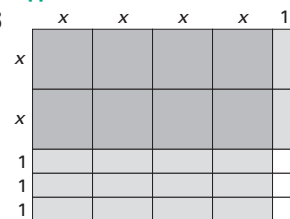
7. $2x(4x) + 2x(1) + 3(4x) + 3(1) = 8x^2 + 2x + 12x + 3 = 8x^2 + 14x + 3$ **9.** $-8x^2 - 14x$ **11.** $-y^2 - 10y - 16$ **13.** $x^2 + 15x + 54$ **15.** $-2b^2 - 10b + 48$ **17.** $15w^3 - 3w^2 - 45w + 9$ **19.** $21t^3 - 3t^5 - 9t^2$ **21.** $-6y^3 - 5y^2$ **23.** $-6b^5 + 16b^3 - 11b^2$ **25.** $6d^2 + 11d + 3$ **27.** $3s^3 + 5s^2 - 3s - 2$ **29.** $x^3 - 38x - 12$ **31.** $6z^2 + 25z + 14$ **33.** $2w^2 + 5w - 25$ **35.** $10t^2 + 9t - 9$ **37.** $4x^2 - 31x - 8$ **39.** $99w^2 - 2w - 80$ **41.** $68.62y^2 - 151.91y + 62.22$ **43.** $4n^2 - \frac{26}{5}n - 12$ **45.** $2.5z^2 + 4.65z - 26.23$ **47.** $-4s^3 - 15s^2 + 3s - 4$ **49.** $2x^2 - 11x - 6$ **51.** $-x^3 - 13x^2 - 40x + 14$ **53.** $3x^2 + \frac{19}{2}x - 10$ **55.** 300 **57.** The revenue decreases from $989.12 million to $678.08 million. **59.** *Sample answer:* As time goes on, the revenue will increase because the value of the model $1.5125t^2 + 156.1846t + 3066.344$ will increase as t increases.

10.2 MIXED REVIEW (p. 589) **63.** $\frac{1}{9}m^2$ **65.** $0.25w^2$ **67.** 4^8, or 65,536 **69.** $256c^8$ **71.** $-w^{12}$ **73.** $512x^6y^{24}$ **75.** one solution **77.** two solutions **79.** two solutions

81.

83.

85.
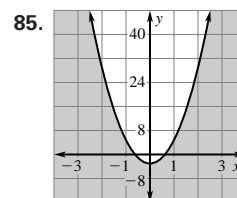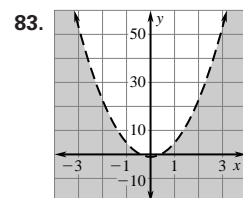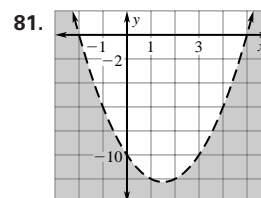
10.3 PRACTICE (pp. 593–594)

5.

$x^2 + 4x + 4$ **7.** $w^2 - 121$ **9.** $4y^2 - 12y + 9$
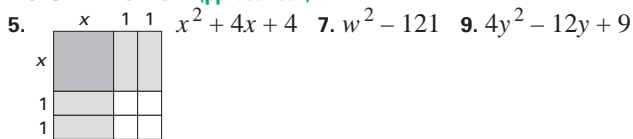
11. $t^2 - 36$ **13.** $4y^2 - 25$ **15.** $x^2 - 9$ **17.** $4m^2 - 4$

19. $9 - 4x^2$ **21.** $x^2 + 10x + 25$ **23.** $9t^2 + 6t + 1$

25. $16b^2 - 24b + 9$ **27.** $x^2 - 16$ **29.** $9x^2 - 1$ **31.** $a^2 - 4b^2$

33. $9y^2 + 48y + 64$ **35.** $4x^2 - \dfrac{1}{4}$ **37.** $9s^2 - 16t^2$ **39.** true

41. true   **43.** 884   **45.** 256   **47.** $(x + 3)^2$, $x^2 + 6x + 9$;
square of a binomial   **49.** $(0.5C + 0.5c)^2 =$
$0.25C^2 + 0.5Cc + 0.25c^2$ **51.** $(0.5F + 0.5f)^2 =$
$0.25F^2 + 0.5Ff + 0.25f^2$ **53.** $P(1 - r)(1 + r) = P(1 - r^2)$
55. a decrease of Pr^2 dollars
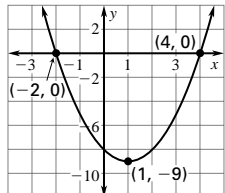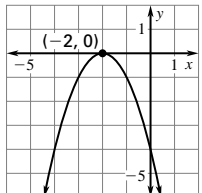
10.3 MIXED REVIEW (p. 594)   **63.** $\dfrac{x^3}{64}$ **65.** $\dfrac{64x^3}{y^9}$ **67.** $9x^2$

69. $\left(-\dfrac{3}{4}, 4\dfrac{7}{8}\right)$; $x = -\dfrac{3}{4}$ **71.** $(2, 20)$; $x = 2$ **73.** $(6, 14)$; $x = 6$

75. $-4, 4$ **77.** $-5, 5$ **79.** $-3, 3$ **81.** Yes; *Sample answer:* Let
x be the length of the rectangle and y be the width. Then
$2x + 2y = 52$ and $xy = 148.75$. Substituting, $x(26 - x) =$
148.75, which is equivalent to $x^2 - 26x + 148.75 = 0$. Since
the discriminant of the equation is 81, the equation has two
solutions. The rectangle is 17.5 by 8.5.

QUIZ 1 (p. 596)   **1.** $3x^2 + 5x + 9$ **2.** $-6x^3 - 14x^2 + 2x - 2$
3. $3t^2 - 13t + 14$ **4.** $6x^3 - 5x^2 + 4x + 3$ **5.** $x^2 + 7x - 8$
6. $16n^2 - 49$ **7.** $-2x^3 + 5x^2 - 6x + 8$ **8.** $27m^2 - 3m - 4$
9. $\dfrac{1}{4}x^2 + x - 15$ **10.** $-12x^5 + 11x^4 - 3x^2$ **11.** $x^2 - 36$
12. $16x^2 - 9$ **13.** $25 - 9b^2$ **14.** $4x^2 - 49y^2$
15. $9x^2 + 36x + 36$ **16.** $36 + 96x + 64x^2$
17.

$(2x - 16)^2 =$
$(4x^2 - 64x + 256)$ in.^{2}
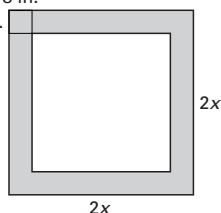
10.4 PRACTICE (pp. 600–601)   **9.** no   **11.** yes   **13.** 3, 5

15. $-9, 2$ **17.** $-\dfrac{1}{4}$ **19.** $-4, -1$ **21.** $-8, 6$ **23.** $9, -8$

25. $2, -1$ **27.** $7, 5$ **29.** -9 **31.** 5.6   **33.** 5   **35.** -4

37. $-3, \dfrac{3}{2}$ **39.** $\dfrac{5}{4}, 3, \dfrac{4}{3}$ **41.** $1.9, -2.1$ **43.** $\dfrac{1}{8}, -\dfrac{3}{50}, \dfrac{2}{9}$ **45.** B

47.

49.

51.

53. Use the distance between
the x-intercepts at $(-500, 0)$
and $(500, 0)$.
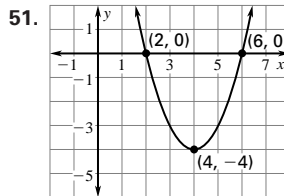
55. 600 ft   **57.** 1200 m

10.4 MIXED REVIEW (p. 602)
61. 210,000   **63.** 857,000,000   **65.** 0.00371   **67.** 0.000722

69. $x^2 - 9x + 14$ **71.** $x^2 + x - 20$ **73.** $x^2 + \dfrac{1}{3}x - \dfrac{2}{9}$

75. $6x^2 + 19x - 7$ **77.** $24x^2 - x - 3$ **79.** $x^2 + 20x + 100$
81. Exponential decay; let P be the price in 1996, t the
number of years since 1996, and y the price after t years;
$y = P(0.84)^t$.   **83.** Exponential decay; let n be the number
of members in 1996, t the number of years since 1996, and
y the number of members after t years; $y = n(0.97)^t$.

10.5 PRACTICE (pp. 607–608)   **5.** D   **7.** B   **9.** The equation
can be solved by factoring because the discriminant, 0, is a
perfect square.   **11.** The equation cannot be solved by
factoring because the discriminant, 40, is not a perfect
square.   **13.** B   **15.** $(x + 9)(x - 1)$ **17.** $(b + 8)(b - 3)$
19. $(y - 6)(y + 3)$ **21.** $(m - 10)(m + 3)$ **23.** $(11 - s)(4 - s)$
25. $(x - 15)(x - 30)$ **27.** $-2, -5$ **29.** 2, 7   **31.** $-1, -15$
33. $-13, 5$ **35.** 3, 17   **37.** $-7, 4$ **39.** $-9, 10$ **41.** 2, 9
43. yes; $(y + 15)(y + 4)$ **45.** no   **47.** no   **49.** $-15, 7$
51. $-32, -20$ **53.** *Sample answer:* $x^2 + 11x + 30 = 0$
55. *Sample answer:* $x^2 - 427x = 0$ **57.** 18 or -1 **59.** $x - 9$
61. $x^2 - x \le 20$ **63.** platform: 95 m by 95 m; building:
57 m by 57 m

10.5 MIXED REVIEW (p. 609)   **73.** 1   **75.** 7   **77.** 18
79. $y^2 + 5y - 36$ **81.** $60 + 3w - 3w^2$
83. $2b^4 + 4b^3 - 6b^2 - 20b$ **85.** $36z^2 + 4z + \dfrac{1}{9}$

87. $-12, -7$ **89.** 19   **91.** 9, 6   **93.** $1, -\dfrac{1}{2}$ **95.** $\dfrac{3}{2}$

10.6 PRACTICE (pp. 614–616)   **5.** B   **7.** A   **9.** $(2x + 1)(x - 2)$

11. cannot be factored   **13.** $-8, \dfrac{1}{2}$ **15.** A   **17.** A

19. $(6b + 1)(b - 2)$ **21.** $(5w + 1)(w - 2)$ **23.** $(2y - 5)(3y + 2)$
25. $(3c - 4)(c - 11)$ **27.** $(7y - 4)(2y - 1)$ **29.** $(2t + 7)(3t - 10)$

31. $(z + 10)(2z - 1)$ **33.** $-2\dfrac{1}{2}, 7$ **35.** $-11, -\dfrac{1}{3}$ **37.** $-1, 9\dfrac{1}{2}$

39. $-8, -1\dfrac{1}{2}$ **41.** $-\dfrac{2}{3}, 4\dfrac{1}{2}$ **43.** $-1\dfrac{1}{2}, 1\dfrac{1}{5}$ **45.** $-1, -\dfrac{5}{8}$

47. $-1\dfrac{1}{9}, 6\dfrac{1}{2}$ **49.** 5   **51.** $-\dfrac{1}{2}, 0$ **53.** $\dfrac{3}{5}, 1\dfrac{1}{7}$ **55.** $-2, 2\dfrac{1}{2}$

57. $-\dfrac{2}{7}, 1\dfrac{3}{8}$ **59.** $\dfrac{-23 - \sqrt{2089}}{24}, \dfrac{-23 + \sqrt{2089}}{24}$ **61.** $\dfrac{8}{23}, 2$

63. $\dfrac{11}{17}, \dfrac{5}{7}$ **65.** 3 sec; $t = 0.125$ is not a reasonable solution
because at that time the acrobat is still rising.
67. $2.5x^2 = 9000$ **69.** $x^2 - x - 12 = 0$; explanations will vary.
71. $6x^2 + x - 1 = 0$; explanations will vary.

10.6 MIXED REVIEW (p. 617) **79.** $(-2, 3)$ **81.** $(40, 40)$
83. not a solution **85.** $b^2 - 81$ **87.** $4a^2 - 49$
89. $10{,}000 + 5400x + 729x^2$

QUIZ 2 (p. 617) **1.** -5 **2.** $\dfrac{3}{2}, 4$ **3.** $-\dfrac{7}{2}, 4$ **4.** $-\dfrac{1}{12}$ **5.** -4

6. $4, -7, -1$ **7.** $-2, \dfrac{1}{2}, \left(-\dfrac{3}{4}, -\dfrac{25}{16}\right)$
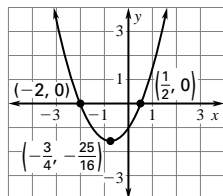
8. $-4, 4, (0, -16)$ **9.** $\dfrac{1}{3}, -2, \left(-\dfrac{5}{6}, -\dfrac{49}{12}\right)$
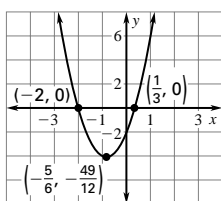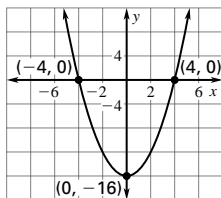
10. $(y + 4)(y - 1)$ **11.** $(w + 2)(w + 11)$ **12.** $(n + 19)(n - 3)$
13. $(x + 6)(x + 11)$ **14.** $(t - 43)(t + 2)$ **15.** $(9 - z)(-5 + z)$
16. $(4b + 9)(3b - 11)$ **17.** $(t + 29)(2t + 5)$
18. $2(3d - 2)(3d - 7)$ **19.** $-6, 1$ **20.** $-25, -1$ **21.** $2, 9$
22. $-5, 34$ **23.** $-37, 2$ **24.** $-\dfrac{17}{2}, -8$ **25.** $-\dfrac{7}{3}, -\dfrac{2}{5}$ **26.** $\dfrac{4}{9}, \dfrac{9}{2}$
27. $-\dfrac{11}{2}, \dfrac{16}{3}$

CONCEPT ACTIVITY 10.7 (p. 618)
1. $(x + 2)^2$ **3.** $(2x + 1)^2$ **5.** $a + b; a + b; (a + b)^2$
7. $(4x + 7)^2$ **9.** $(a - b); (a - b); (a - b)^2$
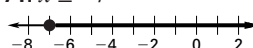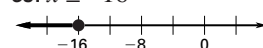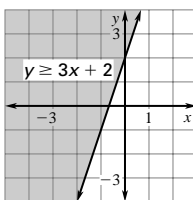
10.7 PRACTICE (pp. 622–623) **7.** $(t + 5)^2$ **9.** $(4 + t)(4 - t)$
11. $2(3 + z)(3 - z)$ **13.** $-12, 12$ **15.** $-5, 5$ **17.** 3
19. $(10x + 11)(10x - 11)$ **21.** $60(y + 3)(y - 3)$
23. $2(7 + t)(7 - t)$ **25.** $(3t - 2q)(3t + 2q)$ **27.** $(x + 4)^2$
29. $(y + 15)^2$ **31.** $(3x + 1)^2$ **33.** $(5n - 2)^2$ **35.** $2(3x + 1)^2$
37. $-4(2w + 5)^2$ **39.** $(z + 5)(z - 5)$; difference of two squares
41. $4(n + 3)(n - 3)$; difference of two squares
43. $4(b - 5)^2$; perfect square trinomial **45.** $-2(x - 13)^2$;
perfect square trinomial **47.** $(x + 100w)(x - 100w)$;
difference of two squares **49.** $\left(x + \dfrac{1}{3}\right)^2$; perfect square
trinomial **51.** $-6, 6$ **53.** $-\dfrac{2}{5}, \dfrac{2}{5}$ **55.** $-\dfrac{3}{2}, \dfrac{3}{2}$ **57.** 9 **59.** $\dfrac{5}{6}$
61. $\dfrac{7}{4}$ **63.** 1.5 in. **65.** $\dfrac{1}{2}$ sec **67.** yes; 7 sec **69.** 32 ft/sec

10.7 MIXED REVIEW (p. 624) **75.** 15 **77.** 2
79. not a solution **81.** solution **83.** $(-2, -6)$ **85.** $(-4, 1)$
87. $5\sqrt{3}$ **89.** 18 **91.** $4\sqrt{2}$ **93.** $-6\sqrt{3}$ **95.** $\dfrac{4}{9}, 6$

10.8 PRACTICE (pp. 629–631) **7.** $3x^2(2 + x^2)$ **9.** no;
$x(7x^2 - 11)$ **11.** no; $3w(3w + 4)(3w - 4)$ **13.** $-5, -6$;
Sample answer: factoring **15.** $6v(v^2 - 3)$ **17.** $3x(1 - 3x)$
19. $2a^2(2a^3 + 4a - 1)$ **21.** $6x^2(4x + 3)$ **23.** $2y(y - 6)(y + 1)$
25. $-7m(m - 3)(m - 1)$ **27.** $4t(t + 6)(t - 6)$
29. $(c^3 - 12)(c + 1)$ **31.** $(b^3 - 4)(6b + 5)$
33. $(a + 6)(a + 2)(a - 2)$ **35.** $3(m^2 - 2)(m - 5)$
37. $-3, -4$; *Sample answer:* factoring **39.** $-13, 9$; *Sample*
answer: factoring **41.** $-3, 9$; *Sample answer:* factoring
43. $0, -4, 4$; *Sample answer:* factoring **45.** $0, \dfrac{29 - \sqrt{593}}{2},$
$\dfrac{29 + \sqrt{593}}{2}$; factoring and quadratic formula
47. $\dfrac{-9 - \sqrt{305}}{16}, \dfrac{-9 + \sqrt{305}}{16}$; quadratic formula
49. $0, \dfrac{-3 - \sqrt{457}}{8}, \dfrac{-3 + \sqrt{457}}{8}$; factoring and quadratic
formula **51.** 3 sec **55.** $L = h - 3, w = h - 9$ **57.** $L = 9$ in.,
$w = 3$ in., $h = 12$ in. **59.** $(3x + 7)(x + 2)$

10.8 MIXED REVIEW (p. 632)
69. $x \le -16$ **71.** $x \ge -7$

73. $-2, 12$ **75.** no solution **77.** $-3, \dfrac{3}{2}$

79.

81. $\dfrac{31}{23} \approx 134.78\%$

QUIZ 3 (p. 632) **1.** $(7x + 8)(7x - 8)$; difference of two squares
2. $(11 + 3x)(11 - 3x)$; difference of two squares
3. $(2t + 5)^2$; perfect square trinomial
4. $2(6 + 5y)(6 - 5y)$; difference of two squares
5. $(3y + 7)^2$; perfect square trinomial **6.** $3(n - 6)^2$; perfect
square trinomial **7.** $-8, 8$ **8.** -4 **9.** $-\dfrac{16}{3}$ **10.** 4 **11.** $-\dfrac{2}{3}, \dfrac{2}{3}$
12. $-\dfrac{1}{3}$ **13.** $3x^2(x + 4)$ **14.** $3x(2x + 1)$ **15.** $9x^3(2x - 1)$
16. $2x(4x^4 + 2x - 1)$ **17.** $2x(x - 1)(x - 2)$
18. $3x(4x - 5)(4x + 5)$ **19.** $(x^2 + 4)(x + 3)$ **20.** $0, -\dfrac{3}{2}, \dfrac{3}{2}$;
factoring special products **21.** $-3, \dfrac{5}{3}$; factoring $ax^2 + bx + c$
22. 2; graphing **23.** 0, about 0.77, about 2.26; quadratic
formula **24.** $0, -3, 4$; factoring **25.** 0, about -7.15,
about -0.35; quadratic formula

CHAPTER 10 REVIEW (pp. 634–636) **1.** $2x^2 + 5x + 7$
3. $x^3 + 2x^2 + 2x - 2$ **5.** $-8x^4 + 12x^3$ **7.** $x^2 + 14x + 33$
9. $2x^3 + 11x^2 - 5x - 50$ **11.** $x^2 - 225$ **13.** $x^2 + 4x + 4$
15. $-1, -10$ **17.** -9 **19.** $9, 12$ **21.** -13 **23.** $(2x - 3)(x + 4)$
25. $(2x - 3)(2x - 3)$ **27.** $-\dfrac{3}{4}$ **29.** $-2x^3(x + 2)(x - 1)$
31. $(x^2 + 5)(3x + 1)$

CHAPTER 11

SKILL REVIEW (p. 642) **1.** $\frac{1}{2}$ **2.** $1\frac{3}{10}$ **3.** $-\frac{3}{55}$ **4.** $1\frac{5}{18}$ **5.** $\frac{4x}{3}$

6. $-21x$ **7.** $3x + 5$ **8.** $\frac{4-x}{2}$ **9.** $-9, 9$ **10.** $1, 1\frac{1}{2}$ **11.** $-1, 4$

11.1 PRACTICE (pp. 646–647) **9.** $\frac{6}{7}$ **11.** $4\frac{1}{2}$ **13.** $-2, 3$

15. Other proportions include:

$\dfrac{\text{height of actual statue}}{\text{height of model}} = \dfrac{\text{length of actual statue}}{\text{length of model}}$,

$\dfrac{\text{height of model}}{\text{height of actual statue}} = \dfrac{\text{length of model}}{\text{length of actual statue}}$,

$\dfrac{\text{length of actual statue}}{\text{height of actual statue}} = \dfrac{\text{length of model}}{\text{height of model}}$.

17. 3 **19.** $5\frac{5}{8}$ **21.** $2\frac{1}{2}$ **23.** -10 **25.** $-1\frac{1}{2}$ **27.** 27 **29.** $2\frac{4}{5}$

31. 2, 5 **33.** 4 **35.** 6 **37.** $1\frac{2}{3}$ **39.** $-\frac{1}{3}$ **41.** 22 in.

43. *Sample answer:* By rewriting 1 ft as 12 in., you can set

up the proportion $\dfrac{\frac{1}{16}\text{ in.}}{12\text{ in.}} = \dfrac{1\text{ in.}}{192\text{ in.}}$. Now that all the units

are the same, you can use the cross product property. This
gives 12 in. = 12 in., which shows that the proportion is
correct. **45.** food: about 16; clothes, accessories: about 4;
books, magazines, comics: about 3; toys, stickers, games:
about 3; movie tickets: about 3; arcade games: about 3;
gifts: about 3; movie rentals: about 3; music: about 2;
footwear: about 2; grooming products: about 2
47. about 4771

11.1 MIXED REVIEW (p. 648) **51.** $-8, 8$ **53.** $-2\sqrt{3}, 2\sqrt{3}$

55. no square roots **57.** $-\frac{3}{5}, \frac{3}{5}$ **59.** $3\sqrt{2}$ **61.** $4\sqrt{5}$ **63.** 54

65. $\sqrt{7}$

11.2 PRACTICE (pp. 652–654) **5.** 175% **7.** 48 **9.** $.36$;
Sample answer: The equations for the two methods are

$a = 0.06(5.99)$ and $\dfrac{a}{5.99} = \dfrac{6}{100}$. Notice that the right side

of the second equation is the rate expressed as a fraction
instead of a decimal. Both methods involve multiplying the
base by the rate. **11.** A **13.** 20 **15.** 30% **17.** 30.8 ft

19. 84 ft **21.** 50 **23.** 150 g **25.** 65.6 tons **27.** $86\frac{1}{9}$%, or

about 86.1% **29.** 480% **31.** $86\frac{2}{3}$%, or about 86.7%;

$13\frac{1}{3}$%, or about 13.3% **33.** about 248 people

35. about 1113 people **37.** 18% **39.** about 420 students
41. yes; no **43.** about 395 people **45.** No; the price is $56
at the first store and $57.60 at the second. **47.** $13.80; the
total cost of the ride

11.2 MIXED REVIEW (p. 655) **53.** $y = 2x$ **55.** $y = \frac{1}{2}x$

57. $y = \frac{3}{2}x$ **59.** solution **61.** solution **63.** $(x + 7)(x - 2)$

65. $(5x - 6)(x - 9)$ **67.** $2x(3x + 8)$ **69.** $3x(x + 2)(x + 5)$

71. $5x^2(3x + 2)(x - 4)$

11.3 PRACTICE (pp. 659–660) **7.** neither **9.** inverse variation

11. $y = \frac{24}{x}$; 3 **13.** $y = 4x$ **15.** $y = 3x$ **17.** $y = \frac{1}{9}x$ **19.** $y = \frac{9}{5}x$

21. $y = \frac{10}{x}$ **23.** $y = \frac{16}{x}$ **25.** $y = \frac{4}{x}$ **27.** $y = \frac{9}{x}$ **29.** $y = \frac{225}{x}$

31. $y = \frac{27}{x}$ **33.** 4, 2, $\frac{4}{3}$, 1   inversely
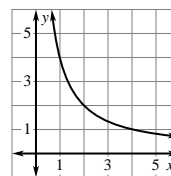
35. 3, 6, 9, 12   directly

37. direct variation; $y = 5x$ **39.** inverse variation

41. neither **43.** 116 lb **45.** $T = \frac{4440}{d}$

47. $\frac{1}{26}$ gal/mi ≈ 0.04 gal/mi **49.** Neither; the equation

cannot be written either in the form $g = km$ or $g = \frac{k}{m}$ for

any constant k.

11.3 MIXED REVIEW (p. 661) **55.** $\frac{3}{4}$ **57.** $\frac{8}{15}$ **59.** $\frac{1}{6}$ **61.** y^6

63. $-\frac{y^2}{x^2}$ **65.** -5, linear, binomial **67.** -1, cubic, binomial

QUIZ 1 (p. 662) **1.** 8 **2.** $\frac{27}{7}$ **3.** 4 **4.** $-\frac{5}{3}, 1$ **5.** $y = \frac{12}{x}$

6. $y = \frac{12}{x}$ **7.** $y = \frac{18}{x}$ **8.** about 904 people

9. about 204 people

TECHNOLOGY ACTIVITY 11.3 (p. 663)
1. directly; 0.825; $y = 0.825x$

11.4 PRACTICE (pp. 667–668) **5.** 5 **7.** C **9.** $\frac{x}{5}$ **11.** $-\frac{3x}{2}$

13. $\frac{6-x}{3x}$ **15.** $\frac{7}{x+12}$ **17.** $-\frac{1}{2x}$ **19.** $\frac{1}{3-x}$ **21.** $\frac{x-4}{x-3}$

23. $\frac{x+1}{x+6}$ **25.** 8 **27.** $-3, 3$ **29.** $-6, 1$ **31.** $\frac{x}{5x+3}$; $\frac{1}{6}$

33. $\frac{x-y}{x}$ **37.** $\frac{1625}{R}$

11.4 MIXED REVIEW (p. 669) **43.** $\frac{25}{2}$ **45.** $-\frac{1}{81}$ **47.** $4m^3$

49. $-\frac{8c^2}{3}$ **51.**

53.

55.
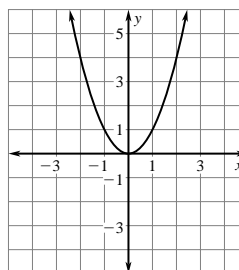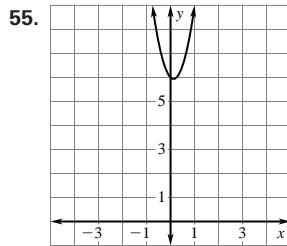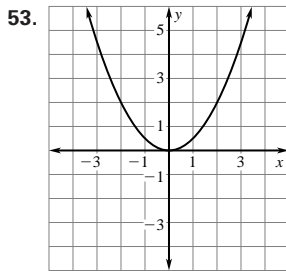
57. $y = 2500(0.92)^x$; 2116; 1947; 1791; 1648; 1516

61. $2x^2 + 6x - 9 = 0$ **63.**

   quadratic

65. $|x - 8500| \le 1000$

11.5 PRACTICE (pp. 673–674) **5.** $\dfrac{2(x+1)}{3}$ **7.** $\dfrac{3x}{x-5}$ **9.** $\dfrac{2x+5}{4x}$

11. $x(3x + 1)$ **13.** x **15.** 8   **17.** $13x$ **19.** $\dfrac{1}{(x+3)(2x+3)}$

21. $\dfrac{5}{6x}$ **23.** 15   **25.** $-\dfrac{x+6}{5x^2}$ **27.** $\dfrac{1}{(x+4)(2x+3)}$ **29.** $-\dfrac{x+1}{5x^2}$

31. $\dfrac{1}{3x}$ **33.** $3x(x+2)$ **35.** $A = \dfrac{(3150 - 400t)(10 - t)}{(1 - 0.12t)(111 - 12t)}$

37. 258 mi   **39.** $R = \dfrac{46 + 0.7t}{1055 + 23t}$; decreasing; *Sample answer:*
The ratios in order (rounded to the nearest hundred-thousandth) are 0.04360, 0.04332, 0.04305, 0.04279, 0.04255, 0.04231, 0.04208, and 0.04186.

43. $\dfrac{2x - 4}{x^2 - 4} = \dfrac{2(x - 2)}{(x + 2)(x - 2)} = \dfrac{2}{x + 2} \cdot \dfrac{x - 2}{x - 2} =$
$\dfrac{2}{x + 2} \cdot 1 = \dfrac{2}{x + 2}$

11.5 MIXED REVIEW (p. 675) **49.** 18   **51.** 162   **53.** $3 - \sqrt{2}$,
$3 + \sqrt{2}$ **55.** $3t^2 + 8t + 10$ **57.** $a^4 + 4a^3 - a - 1$
59. $1000 + 2000r + 1000r^2$

11.6 PRACTICE (pp. 679–681) **5.** 5   **7.** $\dfrac{6x - 5}{20x^2}$ **9.** $\dfrac{3x + 4}{2(x - 5)}$

11. 2   **13.** $\dfrac{2 - 5x}{3x - 1}$ **15.** $\dfrac{1}{x^2}$ **17.** $\dfrac{155}{78x}$ **19.** $-\dfrac{3(x + 12)}{(x + 4)(x - 2)}$

21. $\dfrac{3(x + 3)}{x(x - 3)}$ **23.** $\dfrac{2(x^2 - 20)}{(x - 10)(x + 6)}$ **25.** $\dfrac{4x^2 + 17x + 5}{(3x - 1)(x + 1)}$

27. $-\dfrac{x^2 + 14x - 2}{(3x - 1)(x - 2)}$ **29.** $\dfrac{x + 5}{x + 2}$ **31.** $\dfrac{2(4x^2 + 8x - 5)}{(x + 1)(x - 2)(x + 4)}$

33. $\dfrac{2(7x^2 - 8x - 14)}{(2x - 1)(x - 3)}$ **35.** *Sample answer:* They get very
large; they get very large; they get very close to 2; as x gets
very large, the numbers subtracted in the numerator and
the denominator become insignificantly small compared to
$2x$ and x, so the rational expression gets closer and closer
to $\dfrac{2x}{x} = 2$.   **37.** $\dfrac{48x}{(x - 2)(x + 2)}$ **39.** $\dfrac{1}{x}$; $\dfrac{1}{35} + \dfrac{1}{x}$ **41. a.** A: $\dfrac{3}{56}$;
B: $\dfrac{16}{315}$; C: $\dfrac{18}{385}$ **b.** A or B   **43.** $\dfrac{3x}{7}$ **45.** $\dfrac{4(x - 6)(x - 8)}{(x + 6)(x + 8)}$

47. $\dfrac{5x + 12}{(x - 2)(x + 2)(x + 3)}$ **49.** $\dfrac{8x^2 - 15x + 19}{(2x + 3)(x - 5)(x + 1)}$

11.6 MIXED REVIEW (p. 682) **57.** $\dfrac{2m}{3}$ **59.** $\dfrac{7x}{y^6}$

QUIZ 2 (p. 682) **1.** $\dfrac{3x}{2}$ **2.** $\dfrac{5}{11 + x}$ **3.** $-\dfrac{1}{x - 2}$ **4.** cannot be
simplified   **5.** $\dfrac{7x^2}{2}$ **6.** 10   **7.** $\dfrac{3}{2}$ **8.** $\dfrac{x - 3}{x + 2}$ **9.** $\dfrac{1}{x - 7}$
10. $\dfrac{1}{x + 1}$ **11.** $\dfrac{15}{x + 2}$; $\dfrac{15}{x - 2}$ **12.** $\dfrac{15}{x + 2} + \dfrac{15}{x - 2} = \dfrac{30x}{(x + 2)(x - 2)}$
13. 10 h

11.7 PRACTICE (pp. 687–688) **5.** $y + 2\overline{)y^2 + 0y + 8}$
7. $3y + 5\overline{)8y^2 - 2y + 0}$ **9.** $29\dfrac{15}{29}$ **11.** $x - 5$

13. $-5b^2 + 4b + \dfrac{5}{2}$ **15.** $4x + \dfrac{13}{2}$ **17.** $9c + 3$ **19.** $x + 6$

21. $3a - 18 - \dfrac{12}{a}$ **23.** D   **25.** B   **27.** $a - 2$

29. $2b + 1 - \dfrac{2}{b - 2}$ **31.** $5g - 1 + \dfrac{1}{g + 3}$ **33.** $x + 6 - \dfrac{5}{x - 9}$

35. $-x - 4 - \dfrac{8}{x + 2}$ **37.** $b - 10 + \dfrac{34}{b + 3}$ **39.** $-x + 4 - \dfrac{25}{x + 4}$

41. $-5m - 5 - \dfrac{3}{m - 1}$ **43.** $-s + 5 - \dfrac{21}{s + 5}$ **45.** $\dfrac{1}{2}c - 2 + \dfrac{9}{2c - 6}$

47. $5x + 3$ **49.** $3x + 2$ **51.** $\dfrac{2}{9} - \dfrac{8}{9t + 99}$ **53.** increasing

11.7 MIXED REVIEW (p. 689) **61.** 15   **63.** 3   **65.** $1\dfrac{3}{7}$

67. $-1\dfrac{1}{3}$, $2\dfrac{1}{2}$ **69.** $-1\dfrac{1}{5}$ **71.** 12; 6; 4; 3; 2.4
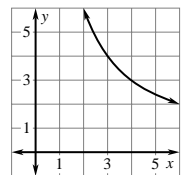
11.8 PRACTICE (pp. 694–696) **7.** $\dfrac{1}{2}$, 1   **9.** 3   **11.** -3

13. $(2, 3)$

15. 28   **17.** $\dfrac{1}{2}$ **19.** 13
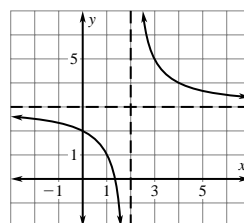
21. -27 **23.** 11   **25.** $1\dfrac{1}{2}$ **27.** $-\dfrac{1}{3}$, 2   **29.** $-8, 9$ **31.** $-8, 2$

33. $\dfrac{3}{5}$ **35.** $-8, 10$ **37.** -4 **39.** B   **41.** A

43. domain: all real numbers except 3
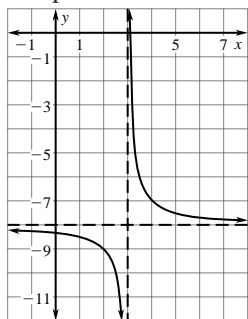
45. domain: all real numbers except −1
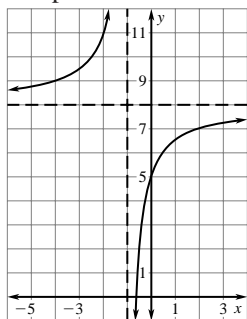
47. domain: all real numbers except −3
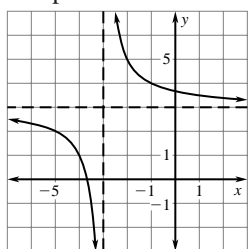
49. domain: all real numbers except 1
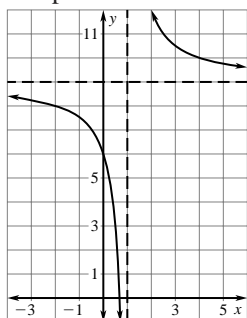
51. 6 hits   **53**. $y = \dfrac{5000 + 10x}{x + 1}$
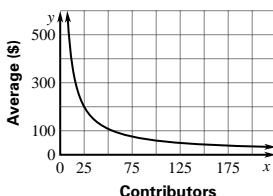
55. $\dfrac{60}{2000} = \dfrac{3}{100}$ **57**. $\dfrac{3}{100} + \dfrac{3}{50x} = \dfrac{3x + 6}{100x}$

59.
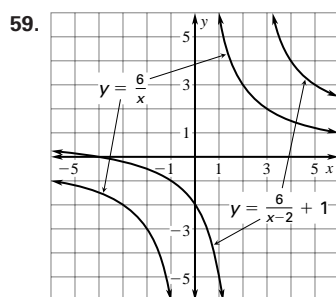
61. *Sample answer:* For $a > 0$, as a increases, the branches of the hyperbola (which are in the first and third quadrants) become wider and more open. For $a < 0$, as $|a|$ increases, the branches of the hyperbola (which are in the second and fourth quadrants) become wider and more open.

11.8 MIXED REVIEW (p. 697)   **69**. 9, 8, 7, 6, 5

71. 0, −1, −4, −9, −16   **73**. $0, \dfrac{1}{2}, 2, 4\dfrac{1}{2}, 8$ **75**. $6^2 = 36$

77. $-4^2 = -16$ **79**. $6\sqrt{2}$ **81**. $\sqrt{13}$ **83**. 16   **85**. $6\sqrt{11}$

QUIZ 3 (p. 697)   **1**. $\dfrac{x}{6} - \dfrac{4}{3x}$ **2**. $\dfrac{3}{5}a + \dfrac{1}{2}$ **3**. $x - 4 + \dfrac{32}{x + 4}$

4. $y + 6.5 + \dfrac{27.5}{2y - 5}$ **5**. $\dfrac{1}{3}z + 2 + \dfrac{20}{3z - 6}$ **6**. $4x + 3 - \dfrac{11}{3x + 2}$

SA34   *Selected Answers*

7. −2   **8**. 4   **9**. 3   **10**. 130   **11**.

12.

13.
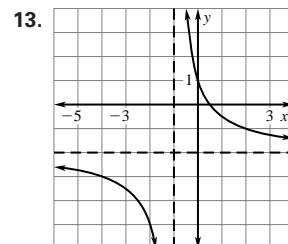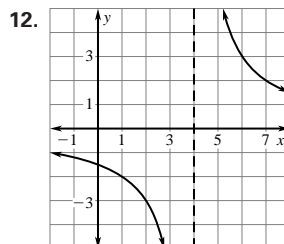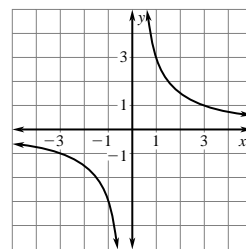
14. $\dfrac{7}{8} - \dfrac{103}{4t + 262}$

TECHNOLOGY ACTIVITY 11.8 (p. 698)   **1**. $y = \dfrac{3x + 2}{x + 5}$; all real numbers except −5 and 5; all real numbers except −5

3. $y = \dfrac{2x + 1}{x - 3}$; all real numbers except −4 and 3; all real numbers except 3   **5**. $y = \dfrac{2x + 3}{x + 1}$; all real numbers except −1 and 3; all real numbers except −1   **7**. *Sample answer:* No; they do not have the same domain. The domain of the first is all real numbers except −3 and 1; the domain of the second is all real numbers except −3.

CHAPTER 11 REVIEW (pp. 700–702)   **1**. $1\dfrac{1}{7}$ **3**. 4   **5**. $76

7. $120   **9**. $y = 3x$ **11**. $\dfrac{x}{3x^2 + 1}$ **13**. $\dfrac{-x^2 + 3}{2x}$ **15**. $20x^2$

17. $\dfrac{(x + 2)^2}{(x + 4)^2}$ **19**. $\dfrac{4x + 3}{24x}$ **21**. $\dfrac{4x - 5}{x - 2}$ **23**. $x - 6 + \dfrac{5}{6x}$

25. $x + 3$ **27**. −4, 2

CHAPTER 12

SKILL REVIEW (p. 708)   **1**. 5.2   **2**. 3.9   **3**. $7\sqrt{2}$ **4**. $2\sqrt{35}$

5. $\dfrac{\sqrt{7}}{2}$ **6**. 3   **7**. $(x - 6)(x + 3)$ **8**. $(x + 4)(x - 2)$

9. $(2x + 5)^2$

12.1 PRACTICE (pp. 712–714)   **3**. 0, 4, 5.7, 6.9, 8

5. 4, 7, 8.2, 9.2, 10   **7**. 1.4, 1.7, 2, 2.2, 2.4   **9**. Both the domain and range are all the nonnegative numbers.

11. domain: all nonnegative numbers; range: all numbers greater than or equal to −10   **13**. domain: all numbers greater than or equal to −5; range: all nonnegative numbers

15.

17.
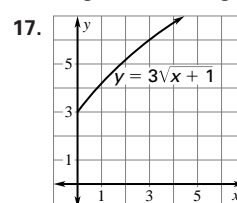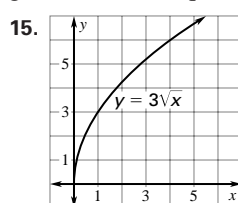
19. 100 lb/in.^{2} **21.** 1 **23.** 4 **25.** 5 **27.** about 1.4
29. 4 **31.** $x \geq 17$ **33.** $x \geq -5$ **35.** all nonnegative numbers
37. all nonnegative numbers   **39.** all nonnegative numbers
41. $x \geq -9$ **43.** all nonnegative numbers
45. Both the domain and range are all the nonnegative numbers.
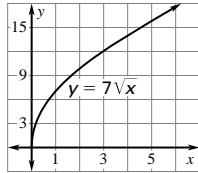
49. domain: all nonnegative numbers; range: all numbers greater than or equal to 4
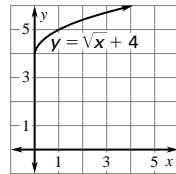
51. domain: all numbers greater than or equal to 4; range: all nonnegative numbers
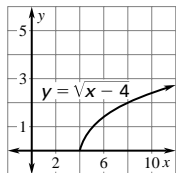
55. domain: all numbers greater than or or equal to -2.5; range: all nonnegative numbers
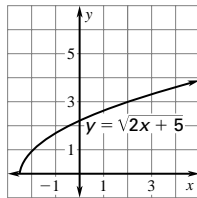
57. 1.41 m^2 **59. a.** cm^2 = cm $\cdot \sqrt{\text{cm}^2 + \text{cm}^2}$ = cm $\cdot$ cm

b.

c. 1456 cm^2 (to the nearest cm^2)

12.1 MIXED REVIEW (p. 714)   **65.** $2\sqrt{6}$ **67.** $5\sqrt{7}$ **69.** $\dfrac{2\sqrt{5}}{5}$
71. $\sqrt{7}$ **73.** $-2 - 2\sqrt{3}, -2 + 2\sqrt{3}$ **75.** $3 - 2\sqrt{2}, 3 + 2\sqrt{2}$
77. $-1\dfrac{1}{2}, 1$ **79.** $x^2 + 9x - 22$ **81.** $10x^2 - 33x + 27$
83. $6x^3 - 4x^2 - 8x - 2$ **85.** $\dfrac{8}{3}$ **87.** $\dfrac{x}{x+1}$

TECHNOLOGY ACTIVITY 12.1 (p. 715)
1. k moves the graph of $y = \sqrt{x}$ up k units if k is positive
and down $|k|$ units if k is negative.   **3.** -2 **5.** 3

12.2 PRACTICE (pp. 719–720)   **5.** $\sqrt{7}$ **7.** $2\sqrt{6}$ **9.** $15 - 6\sqrt{2}$
11. $\dfrac{8 + \sqrt{10}}{18}$ **13.** $6\left(\sqrt{26}\right)^2 - 156 = 6(26) - 156 = 0$; solution
15. $\left(6 + \sqrt{31}\right)^2 - 12\left(6 + \sqrt{31}\right) + 5 = 67 + 12\sqrt{31} - 72 -$
$12\sqrt{31} + 5 = 0$; solution   **17.** $6 - 3\sqrt{2} \approx 1.8$ mi   **19.** $6\sqrt{3}$
21. $\sqrt{6}$ **23.** $6\sqrt{3}$ **25.** $3\sqrt{2}$ **27.** $12\sqrt{5}$ **29.** $-\sqrt{6}$ **31.** 6
33. -12 **35.** $21\sqrt{2} + 6\sqrt{6}$ **37.** $a - 2b\sqrt{a} + b^2$
39. $37 - 20\sqrt{3}$ **41.** $\sqrt{2}$ **43.** $\dfrac{\sqrt{3}}{4}$ **45.** $\dfrac{3 + \sqrt{3}}{2}$ **47.** $\dfrac{42 + 6\sqrt{3}}{23}$

49. $34 + 18\sqrt{17}$ **51.** $\dfrac{45\sqrt{3} + 90}{2}$ **53.** $2 - \sqrt{10}, 2 + \sqrt{10}$
55. $\dfrac{1 - \sqrt{5}}{4}, \dfrac{1 + \sqrt{5}}{4}$ **57.** $3 - \sqrt{22}, 3 + \sqrt{22}$ **59.** 0.35 sec
61. 80 ft/sec

12.2 MIXED REVIEW (p. 721)   **69.** 48
71.

73.
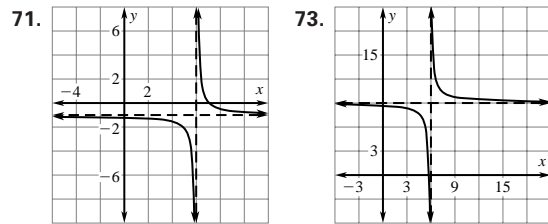
75. domain: all numbers greater than or equal to 8; range: all nonnegative numbers   **77.** domain: all nonnegative numbers; range: all numbers greater than or equal to 4
79. domain: all numbers greater than or equal to -3; range: all nonnegative numbers

12.3 PRACTICE (pp. 725–727)   **5.** 3 **7.** no solution   **9.** 3
11. 25 **13.** 3 **15.** 81 **17.** no solution   **19.** 225 **21.** 216
23. -567 **25.** 17 **27.** 5 **29.** -9 **31.** $13\dfrac{1}{5}$ **33.** 272 **35.** 40
37. no solution   **39.** 5 **41.** no solution   **43.** 10 **45.** 9
47. $6, 48$ **49.** 64 **51.** 49 **53.** 1352 **55.** $15^2 = 225$, not -225;
$x = 225$ **57.** 11.85 **59.** 17 **61.** $3, 4$ **63.** 2
65. *Sample answer:* The graphs do not intersect; the graph
of $y = \sqrt{11x - 30}$ is entirely in the first quadrant, while the
graph of $y = -x$ is entirely in the second and fourth
quadrants.   **67.** 113 **69.** 160 **71.** about 66.3 min
73. By the cross product property, $ad = b^2$, so $b = \sqrt{ad}$.
75. 4 and 25

12.3 MIXED REVIEW (p. 728)   **83.** $-\sqrt{11}, \sqrt{11}$ **85.** $-\dfrac{2}{5}, \dfrac{2}{5}$
87. $-\sqrt{3}, \sqrt{3}$ **89.** $4x^2 - 12x + 9$ **91.** $36y^2 - 16$
**93.** $4a^2 - 36ab + 81b^2$ **95.** $(x - 6)^2$ **97.** 4 **99.** -3 and 2

QUIZ 1 (p. 728)
1. Both the domain and range are all nonnegative numbers.
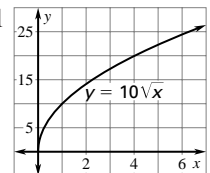
2. domain: all numbers greater than or equal to 9; range: all nonnegative numbers
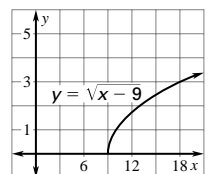
3. domain: all numbers greater than or equal to $\dfrac{1}{2}$; range: all nonnegative numbers
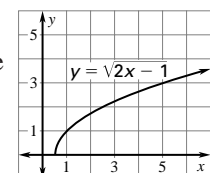
4. all nonnegative numbers, all numbers greater than or equal to $-\dfrac{2}{3}$

$y = \dfrac{\sqrt{x} - 2}{3}$
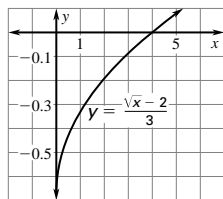
5. $18\sqrt{10}$ **6.** $-8\sqrt{7}$ **7.** $5\sqrt{5}$ **8.** $3\sqrt{6} + 3$ **9.** $32 + 10\sqrt{7}$

10. $\dfrac{40 - 5\sqrt{7}}{19}$ **11.** 144 **12.** 64 **13.** $-\dfrac{1}{3}$ **14.** 6 **15.** 7 **16.** 3

17. $1\dfrac{7}{9}$ lb/in.^{2}

12.4 PRACTICE (pp. 734–735) **3.** 100 **5.** 25 **7.** 121

9. $\dfrac{3 - \sqrt{41}}{2}, \dfrac{3 + \sqrt{41}}{2}$; choices may vary **11.** $-13, -1$

13. no solution **15.** $-\dfrac{2}{3}, -5$; factoring; the expression $3x^2 + 17x + 10$ can be factored $(3x + 2)(x + 5)$. **17.** $\dfrac{5 + \sqrt{85}}{6}$, $\dfrac{5 - \sqrt{85}}{6}$; quadratic formula; the expression is not factorable, and the coefficient of x is odd.

19. $\dfrac{\sqrt{6}}{3}, \dfrac{-\sqrt{6}}{3}$; finding square roots; the expression is equivalent to $x^2 = \dfrac{2}{3}$. **21.** 16 **23.** 121 **25.** 400 **27.** $\dfrac{9}{64}$

29. 6.76 **31.** $\dfrac{1}{9}$ **33.** $-17, 1$ **35.** $2, 6$ **37.** $-\dfrac{21}{2}, -\dfrac{1}{2}$

39. $\dfrac{-3 - \sqrt{109}}{10}, \dfrac{-3 + \sqrt{109}}{10}$ **41.** $\dfrac{-1 - 2\sqrt{3}}{2}, \dfrac{-1 + 2\sqrt{3}}{2}$

43. $\dfrac{10 - \sqrt{107}}{2}, \dfrac{10 + \sqrt{107}}{2}$ **45.** $-1, 5$ **47.** $\dfrac{-3 - \sqrt{41}}{4}, \dfrac{-3 + \sqrt{41}}{4}$ **49.** $\dfrac{30 - 17\sqrt{5}}{10}, \dfrac{30 + 17\sqrt{5}}{10}$ **51.** $-\sqrt{3}, \sqrt{3}$; factoring or finding square roots; both methods are easily applied. **53.** $\dfrac{5}{3}, -\dfrac{5}{3}$; factoring or finding square roots; both methods are easily applied. **55.** $-11, 5$; completing the square or factoring; $a = 1$ and b is an even number. **57.** $-1 - 3\sqrt{3}, -1 + 3\sqrt{3}$ **59.** $-4, 4$

61. $\dfrac{12 - \sqrt{174}}{6}, \dfrac{12 + \sqrt{174}}{6}$ **63.** $0, 2$ **65.** $-\dfrac{3}{7}, 7$

67. $-10 - 3\sqrt{10}, -10 + 3\sqrt{10}$ **69.** $2x(x + 5) = 600$; 30 ft by 20 ft **71.** about 8.58 ft **73.** about 11.8 ft

12.4 MIXED REVIEW (p. 736) **81.** $3\dfrac{1}{7}, 3, 1$ **83.** $-\dfrac{2}{5}, -6$, none

85. $(2, 8)$ **87.** $(3, -2)$ **89.** $-3\sqrt{7}, 3\sqrt{7}$ **91.** $-6, 6$ **93.** $-\dfrac{3}{5}, \dfrac{3}{5}$

95.

$y = -3x^2 - x - 4$

97. $-4, 8$ **99.** $-6, -5$
101. 3 **103.** $(x + 5)(x - 4)$
105. cannot be factored
107. $(2x - 3)(x + 1)$

12.5 PRACTICE (pp. 741–742) **5.** 12 **7.** 40 **9.** 37 **11.** 29 **13.** 5 **15.** $2\sqrt{10}$, or about 6.32 **17.** $5\sqrt{7}$, or about 13.23 **19.** $24, 18$ **21.** $5, 10$ **23.** $1, \sqrt{2}$, or 1, about 1.41 **25.** Yes; $9^2 + 12^2 = 225 = 15^2$. **27.** No; $8^2 + 10^2 = 164$ and $13^2 = 169$. **29.** Yes; $15^2 + 20^2 = 625 = 25^2$. **31.** Yes; $11^2 + 60^2 = 3721 = 61^2$. **33.** Yes; $9.9^2 + 2^2 = 102.01 = 10.1^2$. **35.** hypothesis: a polygon is a square; conclusion: it is a parallelogram **37.** hypothesis: the area of a square is 25 sq. ft; conclusion: the length of a side is 5 ft **39.** about 116.6 ft **41.** 113.58 ft **43.** about 55.6 in.

12.5 MIXED REVIEW (p. 743)

51.

53.
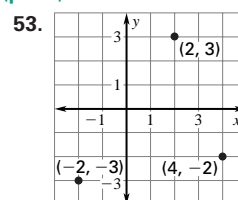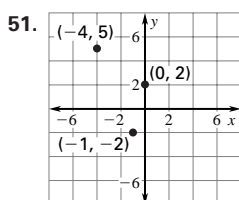
55. no x-intercepts **57.** $\dfrac{-1 - \sqrt{41}}{2}, \dfrac{-1 + \sqrt{41}}{2}$

59. $\dfrac{-3 - \sqrt{5}}{2}, \dfrac{-3 + \sqrt{5}}{2}$ **61.** $-4 - \sqrt{26}, -4 + \sqrt{26}$

63. $2 - \sqrt{5}, 2 + \sqrt{5}$ **65.** $(4x - 5)(4x + 5)$ **67.** $7(x - 2)^2$ **69.** $-3(4x - 9)^2$ **71.** $0.04 \le x \le 0.33$

QUIZ 2 (p. 744) **1.** $-2, 5$ **2.** $\dfrac{-1 - \sqrt{10}}{2}, \dfrac{-1 + \sqrt{10}}{2}$ **3.** $-1 - \sqrt{3}, -1 + \sqrt{3}$ **4.** no **5.** yes **6.** yes **7.** 13 **8.** 60 **9.** 16 **10.** 2000 ft

12.6 PRACTICE (pp. 748–749) **3.** Estimates may vary; 5.66 **5.** Estimates may vary; 6.71 **7.** yes **9.** no

11. $\left(4, -\dfrac{1}{2}\right)$ **13.** 25 yd **15.** 12.08 **17.** 8.60 **19.** 4.24

21. 9 **23.** 10.63 **25.** 2.69 **27.** no **29.** yes **31.** no

33. yes **35.** $(0, 4)$ **37.** $(3, 3)$ **39.** $(3, 5)$ **41.** $\left(-\dfrac{5}{2}, -\dfrac{5}{2}\right)$

43. $\left(-2, -\dfrac{1}{2}\right)$ **45.** $\left(-\dfrac{5}{2}, -4\right)$ **47.** Estimates may vary; about 460 mi **51.** $(-1, 0), \left(1\dfrac{1}{2}, 0\right), \left(-\dfrac{1}{2}, -2\right)$

53. The perimeter of the original triangle, 14.78, is twice that of the perimeter of the new triangle, 7.39.
55. You could meet at a point 1 mi east and 1 mi north of the starting point. Both you and your friend would each have to walk $\sqrt{13} \approx 3.6$ mi. **57.** Side $\overline{DC}$ is parallel to side $\overline{AB}$ because both have slope 2. Sides $\overline{CB}$ and $\overline{DA}$ are not parallel because $\overline{DA}$ has slope -3 and $\overline{CB}$ has slope $\dfrac{1}{3}$.

12.6 MIXED REVIEW (p. 750) **65.** $3x(x + 5)(x - 1)$ **67.** inverse variation **69.** neither **71.** $\dfrac{7x^2 - 2x}{14}$ **73.** $30(14) = 21x$; 20 in.

12.7 PRACTICE (pp. 755–757) **3.** $\frac{7}{25}$ **5.** $\frac{7}{24}$ **7.** $e \approx 27.16$, $f \approx 56.02$ **9.** about 459 ft; about 655 ft **11.** $\sin R = \frac{5}{13}$, $\cos R = \frac{12}{13}$, $\tan R = \frac{5}{12}$; $\sin S = \frac{12}{13}$, $\cos S = \frac{5}{13}$, $\tan S = \frac{12}{5}$ **13.** $b \approx 12.81$, $c \approx 21.29$ **15.** $x \approx 13.42$, $y \approx 19.90$ **17.** $v \approx 51.96$, $w = 60$ **19.** about 172 ft **21.** about 170 ft **23.** 11.56 km

12.7 MIXED REVIEW (p. 757) **29.** False; the opposite of a positive number is negative. **31.** $-p^2 - p$ **33.** $x^2 + 3x$ **35.** $-24x - 6x^2$ **37.** $2x^3 + 6x^2 + 15x + 6$ **39.** $5x^2 - 4x + 12$ **41.** $\frac{3}{4a+1}$ **43.** $-\frac{13}{12x}$ **45.** $\frac{4(x-1)}{(x+1)}$

12.8 PRACTICE (pp. 761–763) **13.** Multiplication axiom of equality; Substitution property of equality
15. $a - b = a + (-b)$ Definition of subtraction
$\qquad a - b = -b + a$ Commutative property of addition
17. $a + (-1)(a) = 1(a) + (-1)(a)$ Identity property of multiplication
$\qquad = [1 + (-1)](a)$ Distributive property
$\qquad = (0)(a)$ Inverse property of addition
$\qquad = 0$ Multiplication property of 0
Since $a + (-1)(a) = 0$, $(-1)(a) = -a$ by definition.
19. *Sample answer*: $(1 + 2)^2 \neq 1^2 + 2^2$ **21.** *Sample answer*: 2 and 3 are integers, but $\frac{2}{3}$ is not an integer. **23.** Yes; this map shows that the proposal is false. **25.** Assume that p is an integer, p^2 is odd, and p is even. Let $p = 2n$. Then $p^2 = (2n)^2 = 4n^2 = 2(2n^2)$, an even number, which is impossible since p^2 is odd. Then p must be odd. **27.** Assume that $ac > bc$, $c > 0$, and $a \leq b$. By the multiplication property of inequality, $ac \leq bc$, which is impossible since it was given that $ac > bc$. Then $a > b$.

12.8 MIXED REVIEW (p. 764) **31.** no real solutions **33.** one solution **35.** two solutions **37.** two solutions **39.** two solutions **41.** not a solution **43.** not a solution **45.** solution **47.** not a solution **49.** 82% **51.** 200% **53.** $15.15

QUIZ 3 (p. 764) **1.** 13.42; $(4, -3)$ **2.** 10; $(2, -8)$ **3.** 16.12; $(4, -7)$ **4.** 16; $(-8, 0)$ **5.** 6; $(0, 4)$ **6.** 10.30; $\left(-\frac{3}{2}, \frac{5}{2}\right)$ **7.** 5; $\left(0, -\frac{3}{2}\right)$ **8.** 7.28; $\left(\frac{1}{2}, 2\right)$ **9.** 8.06; $\left(\frac{5}{2}, 0\right)$ **10.** $\sin A = \frac{3}{5}$, $\cos A = \frac{4}{5}$, $\tan A = \frac{3}{4}$; $\sin B = \frac{4}{5}$, $\cos B = \frac{3}{5}$, $\tan B = \frac{4}{3}$ **11.** $\sin A = \frac{15}{17}$, $\cos A = \frac{8}{17}$, $\tan A = \frac{15}{8}$; $\sin B = \frac{8}{17}$, $\cos B = \frac{15}{17}$, $\tan B = \frac{8}{15}$
12. $(a - b)c = [a + (-b)]c$ Definition of subtraction
$\qquad = a(c) + (-b)c$ Distributive property
$\qquad = ac + (-bc)$ $\quad (-b)c = -bc$
$\qquad = ac - bc$ Definition of subtraction
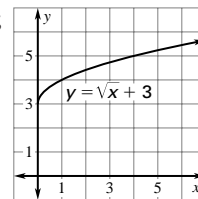
13. Any real numbers a, b, and c with $a < b$ and $c \leq 0$. *Sample answer*: $a = 1$, $b = 2$, and $c = -1$: $1 < 2$, and $1(-1) > 2(-1)$. **14.** Accept any real numbers a and b with $b \neq 0$. *Sample answer*: $a = 1$ and $b = 2$; $-(1 + 2) \neq (-1) - (-2)$.

CHAPTER 12 REVIEW (pp. 766–768)
**1.** Both the domain and range are all nonnegative numbers.
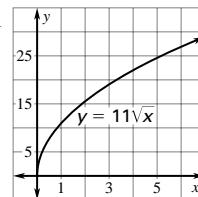
3. domain: all nonnegative numbers; range: all numbers greater than or equal to 3

5. $6\sqrt{2} - 8\sqrt{3}$ **7.** $11 + 4\sqrt{6}$ **9.** 2 **11.** no solutions **13.** $2 - 2\sqrt{3}$, $2 + 2\sqrt{3}$ **15.** $\frac{1 - \sqrt{113}}{4}$, $\frac{1 + \sqrt{113}}{4}$ **17.** 1 **19.** $3\sqrt{10}$, $\left(\frac{19}{2}, \frac{1}{2}\right)$ **21.** $2\sqrt{29}$, $(0, 3)$ **23.** commutative property of multiplication

CUMULATIVE PRACTICE (pp. 772–773) **1.** $\frac{m}{7} \geq 16$; $m \geq 112$ **3.** $t = 3\frac{2}{3}(3)$; 11 mi **5.** -2 **7.** -63 **9.** -15 **11.** $11\frac{1}{3}$ **13.** -49 **15.** $-1\frac{7}{11}$ **17.** -5.35 **19.** Accept any equation of the form $y = \frac{2}{3}x + b$ for any number b except -1. **21.** function; domain: -1, 1, 3, 5, 7; range: -1, 1, 3, 5 **23.** function; domain: -2, -1, 0, 1, 2; range: -2, -1, 0, 1 **25.** $4x - 5y = 15$ **27.** $-\frac{5}{4} \leq x < 3$
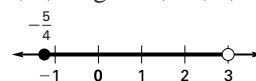
29. $x > 3$ or $x < 2$
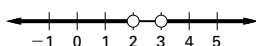
31. $(24, 21)$ **33.** b^6; 64 **35.** $-8a^3b^6$; -512 **37.** $\frac{4b^5}{a^4}$; 128 **39.** two solutions; $\frac{\sqrt{39}}{3}$, $-\frac{\sqrt{39}}{3}$ **41.** one solution; -1 **43.** $(x - 28)(x + 4)$ **45.** $(2x + 3)^2$ **47.** $(x - 7)^2$ **49.** $-1\frac{1}{2}$, $1\frac{2}{3}$ **51.** -5, -2, 2 **53.** $\frac{2}{3}$ **55.** $\frac{2}{x-3}$ **57.** $\frac{1}{3x}$ **59.** $\frac{x(2x-7)}{(x+4)(x-1)}$ **61.** $-15\sqrt{2}$ **63.** $\frac{77 + 11\sqrt{3}}{46}$ **65.** $b = 19.80$, $c = 21.36$ **67.** $13\frac{1}{3}$ months

SKILLS REVIEW HANDBOOK

FACTORS AND MULTIPLES (p. 778) **1.** 1, 2, 3, 6, 9, 18
3. 1, 7, 11, 77 **5.** 1, 3, 9, 27 **7.** 1, 2, 3, 6, 7, 14, 21, 42
9. 1, 2, 4, 13, 26, 52 **11.** 1, 11, 121 **13.** 3^3 **15.** 2^5
17. $5 \cdot 11$ **19.** $2^4 \cdot 3$ **21.** $2 \cdot 3^2 \cdot 5$ **23.** $3 \cdot 13$
25. $2^3 \cdot 7 \cdot 13$ **27.** 2^9 **29.** 1, 3, 5, 15 **31.** 1, 5 **33.** 1, 3, 9
35. 1, 5 **37.** 5 **39.** 1 **41.** 14 **43.** 51 **45.** 2 **47.** 29 **49.** 14
51. 1 **53.** 35 **55.** 48 **57.** 12 **59.** 420 **61.** 100 **63.** 51
65. 70 **67.** 330

COMPARING AND ORDERING NUMBERS (p. 780) **1.** $<$
3. $>$ **5.** $<$ **7.** $<$ **9.** $<$ **11.** $>$ **13.** $=$ **15.** $>$ **17.** $>$ **19.** $>$
21. $>$ **23.** 40,071; 40,099; 45,242; 45,617 **25.** 9.003,
9.027, 9.10, 9.27, 9.3 **27.** $\frac{1}{3}, \frac{3}{8}, \frac{5}{6}, \frac{5}{4}$ **29.** $\frac{15}{16}, 1\frac{1}{8}, 1\frac{2}{5}, \frac{5}{3}, \frac{7}{4}$
31. $\frac{5}{12}, \frac{7}{8}, \frac{5}{4}, 1\frac{1}{3}$ **33.** Goran

FRACTION OPERATIONS (p. 783) **1.** $\frac{5}{6}$ **3.** $\frac{1}{3}$ **5.** $\frac{5}{8}$ **7.** $1\frac{1}{30}$
9. $2\frac{3}{8}$ **11.** $1\frac{13}{24}$ **13.** $8\frac{1}{5}$ **15.** $3\frac{7}{16}$ **17.** $\frac{1}{7}$ **19.** $1\frac{5}{7}$ **21.** 20
23. $2\frac{3}{5}$ **25.** $\frac{5}{6}$ **27.** 3 **29.** $\frac{5}{32}$ **31.** $3\frac{1}{2}$ **33.** $\frac{1}{4}$ **35.** $\frac{1}{6}$ **37.** $\frac{2}{3}$
39. $7\frac{2}{3}$ **41.** $1\frac{1}{6}$ **43.** $1\frac{1}{5}$ **45.** 6 **47.** $\frac{17}{20}$ **49.** $\frac{13}{16}$ **51.** 1 **53.** $5\frac{3}{8}$
55. $\frac{7}{18}$ **57.** $2\frac{5}{6}$ **59.** $1\frac{3}{5}$ **61.** $1\frac{11}{40}$ **63.** $\frac{11}{40}$ **65.** $9\frac{29}{48}$ in.

FRACTIONS, DECIMALS, AND PERCENTS (p. 785)
1. 0.63, $\frac{63}{100}$ **3.** 0.24, $\frac{6}{25}$ **5.** 0.17, $\frac{17}{100}$ **7.** 0.45, $\frac{9}{20}$
9. $0.\overline{3}, \frac{1}{3}$ **11.** 0.625, $\frac{5}{8}$ **13.** 0.052, $\frac{13}{250}$ **15.** 0.0012, $\frac{3}{2500}$
17. 8%, $\frac{2}{25}$ **19.** 150%, $1\frac{1}{2}$ **21.** 5%, $\frac{1}{20}$ **23.** 480%, $4\frac{4}{5}$
25. 375%, $3\frac{3}{4}$ **27.** 52%, $\frac{13}{25}$ **29.** 0.5%, $\frac{1}{200}$ **31.** 0.7, 70%
33. 0.44, 44% **35.** 0.375, 37.5% **37.** 5.125, 512.5%
39. 0.875, 87.5% **41.** 0.833, 83.3% **43.** 0.533, 53.3%
45. 1.417, 141.7%

USING PERCENT (p. 786) **1.** $16\frac{2}{3}$% **3.** 37.5% **5.** $66\frac{2}{3}$%
7. $16\frac{2}{3}$% **9.** 18.75% **11.** 9 **13.** 48 **15.** 38 **17.** 42
19. $1.04 **21.** $3.38

RATIO AND RATE (p. 787) **1.** 15 to 4 **3.** $\frac{3}{5}$ **5.** $\frac{12}{17}$ **7.** 17:3
9. 2 to 3 **11.** 15 to 7 **13.** 1 to 4 **15.** $22.50 per ticket
17. 52 miles per hour **19.** 28 miles per gallon **21.** $.10 per
minute **23.** $21.\overline{6}$ meters per second **25.** $1.12 per mile

COUNTING METHODS (p. 789) **1.** 9 outfits **3.** 56,700 pairs
5. 10,000 numbers **7.** 67,600 PINs; 58,500 PINs

PERIMETER, AREA, AND VOLUME (p. 791) **1.** 34 units
3. 84 ft **5.** 72 ft **7.** 841 yd^2 **9.** 12.25 in.^{2} **11.** 51.84 cm^2
13. 2025 km^2 **15.** 15,625 ft^3 **17.** 420 yd^3 **19.** 212 in.^{3}

DATA DISPLAYS (p. 794) **1–9 odd:** Sample answers are
given. **1.** 0–25 with increases of 5 **3.** 0–20 with increases
of 5

5.
Ski Runs

7.
Stock Prices

9.
Fat in One Tablespoon
of Canola Oil
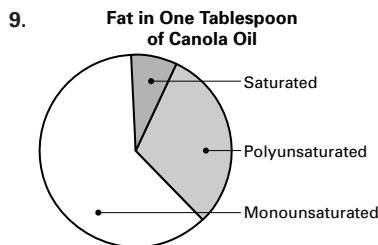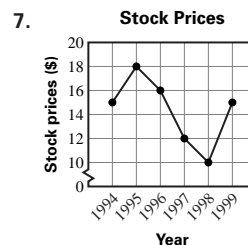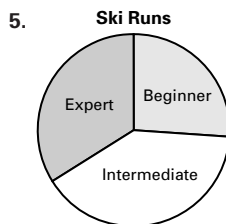
PROBLEM SOLVING (p. 796) **1.** 5 sandwiches, 3 cartons of
milk **3.** $26.25 **5.** no later than 6:25 A.M. **7.** 10 groups
9. The problem cannot be solved; not enough information
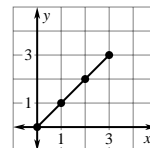is given.

EXTRA PRACTICE

CHAPTER 1 (p. 797) **1.** 105 **3.** 18 **5.** 526 **7.** 75 **9.** 1536
11. 216 **13.** 83 **15.** 15 **17.** 31 **19.** 7 **21.** 3 **23.** 3
25. 7 **27.** 24 **29.** solution **31.** solution **33.** solution
35. not a solution **37.** $25n - 13 = 37$

39.
Wireless Subscribers

Wireless Subscribers
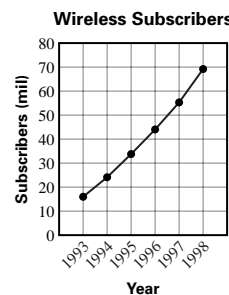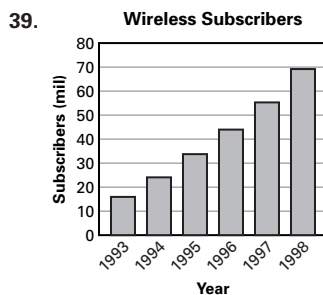
41. Input: 0, 1, 2, 3;
Output: 4.5, 5.5, 6.5, 7.5
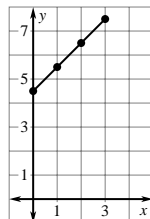
43. Input: 0, 1, 2, 3;
Output: 0, 1, 2, 3

CHAPTER 2 (p. 798)
1. $-7 < 8, 8 > -7$
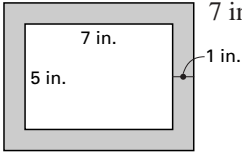
3. $-2.5 < -2.4, -2.4 > -2.5$

5. 8.5 **7.** 7 **9.** 5 **11.** -2 **13.** 3 **15.** -3 **17.** -13 **19.** 4
21. 7.3 **23.** -12 **25.** $\begin{bmatrix} 6 & 2 \\ 8 & 8 \end{bmatrix}$ **27.** $\begin{bmatrix} -3 & 2 & 10 \\ 0 & -3 & 14 \end{bmatrix}$ **29.** -45
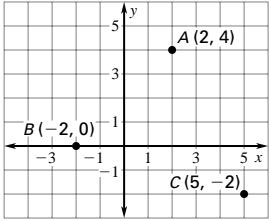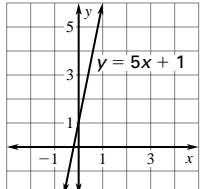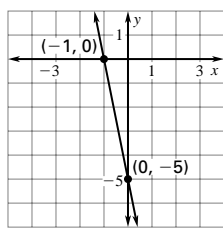**31.** $32x$ **33.** $-c^4$ **35.** $4a^4$ **37.** $4a - 24$ **39.** $-r^2 + 5r$
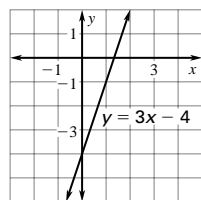
41. $6x^2 + 24x$ **43.** $3z - 8.4$ **45.** $3.1m$ **47.** $2 - 4t$ **49.** $6x^2 + 5$
51. $\frac{1}{2}x$ **53.** -4 **55.** $\frac{3x}{4}$ **57.** $-32x$ **59.** 66 **61.** 1 to 4
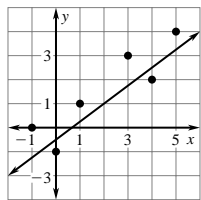
CHAPTER 3 (p. 799) **1.** 14 **3.** 16 **5.** -3 **7.** 3 **9.** 5
11. -20 **13.** $\frac{1}{3}$ **15.** -4 **17.** 4 **19.** 3 **21.** 40 **23.** $-\frac{4}{3}$
25. 1 **27.** all real numbers **29.** no solution
31. 7 in., 9 in. **33.** -7.46

7 in. / 5 in. / 1 in.

35. 0.27 **37.** 1.01 **39.** $y = -x + 3$; $5, 4, 3, 2$ **41.** $y = \frac{3}{2}x + \frac{3}{4}$;
$-2\frac{1}{4}, -\frac{3}{4}, \frac{3}{4}, 2\frac{1}{4}$ **43.** $y = x - 12$; $-14, -13, -12, -11$
45. $.60$ per yogurt snack **47.** 48.8 mi/h **49.** 0.75 cup
51. 64% **53.** 36%

CHAPTER 4 (p. 800)
1.

$A\,(2, 4)$
$B\,(-2, 0)$
$C\,(5, -2)$

7.

$y = 5x + 1$

15. $-1, -5$

$(-1, 0)$
$(0, -5)$

17. $2\frac{1}{2}, -5$ **19.** $-7, 14$
21. $2, 6$ **23.** 0
25. 2 **27.** -7
29. -1 **31.** $y = 3x$

33. $y = -\frac{7}{8}x$ **35.** $y = x$ **37.** $y = \frac{4}{5}x$ **39.** 525 **41.** $y = 3$
43. $y = -4$ **45.** $y = x + 1$ **47.** $y = 3x - 4$
49. -6 **51.** 2 **53.** 3 **55.** $\frac{1}{3}$
57. not a function **59.** not a function

$y = 3x - 4$

CHAPTER 5 (p. 801) **1.** $y = 2x + 1$ **3.** $y = x - 3$ **5.** $y = 3x + 3$
7. $y = 6$ **9.** $y = 4x + 11$ **11.** $y = \frac{1}{2}x - 2$ **13.** $y = 3x - 11$
15. $y = \frac{7}{5}x - 6$ **17.** $y = 7$ **19.** $y = -x + 2$
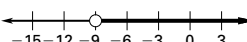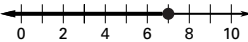**21.**

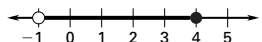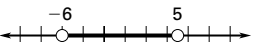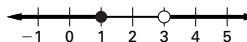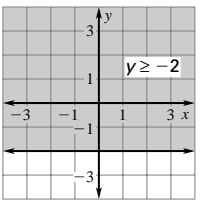Sample answer: $y = \frac{3}{4}x - \frac{1}{2}$

23. $y - 3 = -2(x - 5)$; $y = -2x + 13$ **25.** $y - 4 = 5(x - 5)$;
$y = 5x - 21$ **27.** $y + 5 = -\frac{5}{3}(x + 3)$; $y = -\frac{5}{3}x - 10$

29. $y - 4 = -\frac{1}{2}(x - 2)$; $y = -\frac{1}{2}x + 5$ **31.** $3x - y = 17$
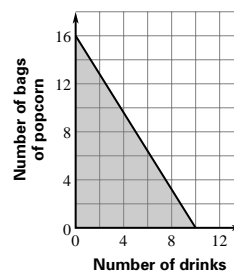**33.** $3x - 4y = -3$ **35.** $y = 7$ **37.** $5x - y = -5$
39.
Windchill for Wind Speed of 5 mi/h

Windchill temperature (°F)
Actual temperature (°F)
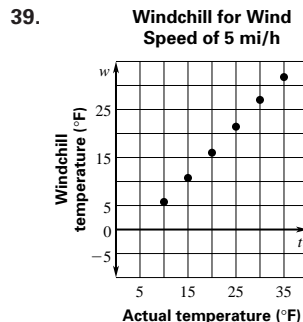
41. Solution may vary depending upon method used to derive the linear model; $-1°F$.

CHAPTER 6 (p. 802) **1.** $x > -9$

3. $y \le 7$

5. $k \le 18$ **7.** $x > -2$

9. $x \ge -12$ **11.** $x \ge -1$ **13.** $x < -2$
15. $4 \ge x > -1$ **17.** $-6 < x < 5$

19. $x > 3$ or $x \le 1$

21. $-14, -6$

23. $1, 7$ **25.** $x \le -8$ or $x \ge 5\frac{1}{3}$ **27.**

$y \ge -2$

35. $2x + 1.25y \le 20$

Number of bags of popcorn
Number of drinks
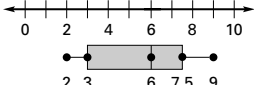
37.
1	3 6
2	1 2
3	1 3 5
4	0 1 5
5	1
6	5 6
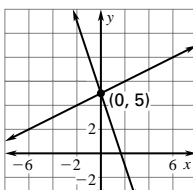
Key: $6\,|\,5 = 65$

39.
0	2 8
1	9
2	1 2 7
3	8 9 9
4	1 3 4 6 9
5	1 4 6
6	0 2 3

Key: $6\,|\,0 = 60$

41. $12, 13, 13$ **43.** $129, 123, 112$ **45.** $16, 31, 76$
47. $20, 26.5, 77$ **49.**

2 3   6 7.5 9

CHAPTER 7 (p. 803) **1.** $(-2, 5)$ **3.**

$(0, 5)$

5. $(-1, -4)$ **7.** $(4, 5)$ **9.** $(-5, -1)$ **11.** $(6, 3)$ **13.** $\left(5\frac{1}{7}, \frac{1}{7}\right)$

15. $\left(15\frac{1}{2}, -24\right)$ **17.** $(2, 0)$ **19.** $(0, -2)$ **21.** $(13, -2)$

23. $(4, -28)$ **25.** 3 student, 5 adult   **27.** Company A

29. no solution   **31.** one solution, $(0, -5)$

33. infinitely many solutions   **35.** no solution
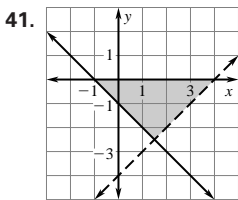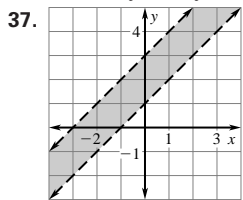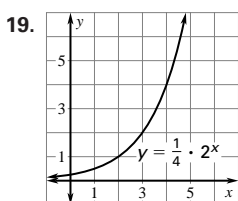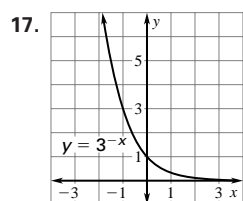
37.   **41.**

CHAPTER 8 (p. 804)
1. 7^5, or $16,807$ **3.** $1728x^3$

5. $-128r^4s^8$ **7.** $675x^3y^2$ **9.** $\dfrac{1}{m^4}$ **11.** x^2y **13.** $\dfrac{x^4}{y^3}$ **15.** $6x^4$

17.   **19.**   **21.** 8

23. $\dfrac{27x^3z^9}{8}$ **25.** $\dfrac{1}{10a^4bc^5}$ **27.** $\dfrac{25y^{17}}{x^7}$ **29.** $\dfrac{1}{216} \approx 0.005$

31. $31,100$ **33.** 9.43 **35.** 0.0012468 **37.** $60,901,300,000$

39. 3.78×10^{-2} **41.** 3.3×10^7 **43.** 2.08054×10^{-1}

45. 8.91×10^{-4} **47.** $\$1791.78$ **49.** $\$3724.99$

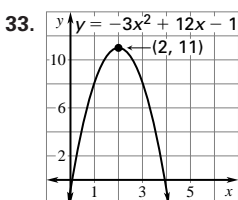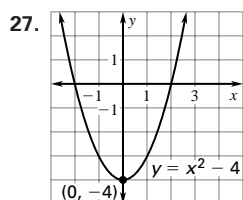**51.** exponential decay; 0.5; 50%   **53.** exponential growth;

1.04; 4%   **55.** exponential decay; $\dfrac{2}{3}$; $33\frac{1}{3}\%$

57. exponential decay; 0.68; 32%

CHAPTER 9 (p. 805)
1. -10 **3.** -0.5 **5.** 19.47 **7.** 14.83

9. $-5, 5$ **11.** no solution   **13.** $-4, 4$ **15.** $-\sqrt{3}, \sqrt{3}$

17. about 3.06 sec   **19.** 168   **21.** $-84\sqrt{5}$ **23.** 2   **25.** $\dfrac{\sqrt{10}}{3}$

27.   **33.**

35. $-3, -2$ **37.** $-6, 6$ **39.** $-3, 3$ **41.** $-1, 3$

43. $3r^2 + 8r + 2 = 0$; $\dfrac{-4 - \sqrt{10}}{3}, \dfrac{-4 + \sqrt{10}}{3}$

45. $-x^2 + 5x - 4 = 0$; 1, 4

47. $2x^2 - 6x - 5 = 0$; $\dfrac{3 - \sqrt{19}}{2}, \dfrac{3 + \sqrt{19}}{2}$

49. $-2x^2 + x + 10 = 0$; $-2, \dfrac{5}{2}$ **51.** 0; one solution

53. 0; one solution   **55.** -136; no real solution

57. -47; no real solution   **67.** quadratic

CHAPTER 10 (p. 806)
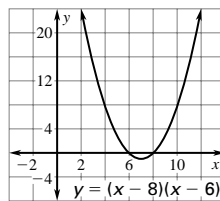**1.** $8x^2 + 1$ **3.** $14x^2 - 7x + 8$

5. $x^2 + 9x - 4$ **7.** $4x^3 - 8x^2 + 7x$ **9.** $15b^5 - 10b^4 + 5b^2$

11. $d^2 + 4d - 5$ **13.** $x^3 + x^2 + 18$ **15.** $x^2 + 18x + 81$

17. $a^2 - 4$ **19.** $16x^2 + 40x + 25$ **21.** $4a^2 - 9b^2$

23. $-3, -6$ **25.** $1, -5$ **27.** $\dfrac{3}{2}, 7$ **29.** $1, 2$

31. 6, 8; $(7, -1)$ **33.** 5, 7; $(6, -1)$
35. 5, 9; $(7, 4)$
37. $-1, 3$; $(1, -4)$

39. -3 **41.** 6   **43.** 6, 9   **45.** $-4, 6$ **47.** $-2, 1\frac{1}{2}$ **49.** $-\dfrac{4}{3}$

51. $-\dfrac{3}{4}, 2$ **53.** $-2\frac{1}{3}, 8$ **55.** $(x + 1)(x - 1)$; difference of

two squares   **57.** $(11 - x)(11 + x)$; difference of

two squares   **59.** $(t + 1)^2$; perfect square trinomial

61. $(8y + 3)^2$; perfect square trinomial   **63.** $x^2(x + 3)(x - 3)$

65. $x^2(x + 9)(x - 5)$ **67.** $-3y(y + 4)(y + 1)$ **69.** $7x^4(x^2 - 3)$

71. 2 in. by 6 in. by 15 in.

CHAPTER 11 (p. 807)
1. $-4, 4$ **3.** 4   **5.** 6   **7.** $-6, 1$ **9.** 24

11. 21 lb   **13.** 252   **15.** inverse variation; $xy = 2$

17. $\dfrac{2x^3}{7}$ **19.** $\dfrac{1}{x + 1}$ **21.** $\dfrac{1}{4}$ **23.** $\dfrac{1}{2}$ **25.** $\dfrac{x^2}{5}$ **27.** $\dfrac{5}{8x^2}$

29. $\dfrac{5x}{x - 8}$ **31.** $\dfrac{1}{x}$ **33.** $\dfrac{-4x - 61}{(x + 7)(x - 4)}$ **35.** $\dfrac{63x - 2}{18x^2}$

37. $2x^2 + x + \dfrac{1}{7}$ **39.** $2(2x - 1)$ **41.** $-4, 10$ **43.** 3   **45.** 6
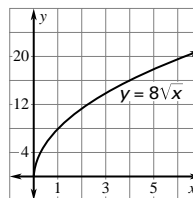
CHAPTER 12 (p. 808)
1. all nonnegative numbers;
all nonnegative numbers
3. all numbers greater than
than or equal to -3;
all nonnegative numbers

5. all numbers greater than or equal to 2; all nonnegative

numbers   **7.** all numbers greater than or equal to $-\dfrac{2}{3}$;

all nonnegative numbers   **9.** $5\sqrt{5}$ **11.** $16\sqrt{2}$

13. $7\sqrt{3} - 3\sqrt{2}$ **15.** $\dfrac{\sqrt{6}}{3}$ **17.** 121   **19.** 5   **21.** 2, 6

23. $-14, 4$ **25.** 2, 5   **27.** $\dfrac{6 - \sqrt{111}}{5}, \dfrac{6 + \sqrt{111}}{5}$ **29.** $c = \sqrt{2}$

31. $a = 8$ **33.** $a = 20$ **35.** 4.12; $\left(2, 4\frac{1}{2}\right)$ **37.** 5; $(2.5, -2)$

39. 8; $(3, -6)$ **41.** 18.36; $\left(4, -2\frac{1}{2}\right)$ **43.** $\sin D = \dfrac{4}{5}, \cos D = \dfrac{3}{5}$,

$\tan D = \dfrac{4}{3}$; $\sin E = \dfrac{3}{5}, \cos E = \dfrac{4}{5}, \tan E = \dfrac{3}{4}$ **45.** $\sin D = \dfrac{\sqrt{2}}{2}$,

$\cos D = \dfrac{\sqrt{2}}{2}, \tan D = 1$; $\sin E = \dfrac{\sqrt{2}}{2}, \cos E = \dfrac{\sqrt{2}}{2}, \tan E = 1$

47. $a = 25.37, b = 9.23$ **49.** any nonzero numbers b and c

and any nonzero number a except 1