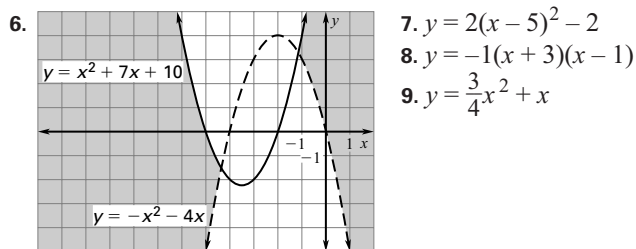
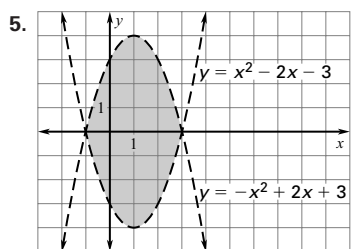
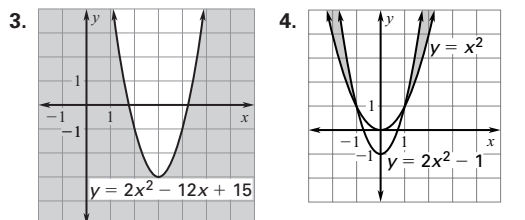
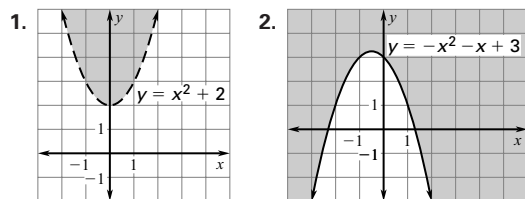


25. $y = -x^2 + x + 4$ 27. $y = -\frac{3}{4}x^2 - \frac{11}{4}x + 1$
 29. $y = -x^2 + 5x - 2$ 31. $y = -2x^2 - 4x + 9$
 33. $y = \frac{5}{2}x^2 + 6x - 8$ 35. $y = -0.00168(x - 0)(x - 24)$
 37. $s = -0.0807p^2 + 55.2p + 330$;
 $k = -0.0000609p^2 + 0.626p + 125$

5.8 MIXED REVIEW (p. 312)

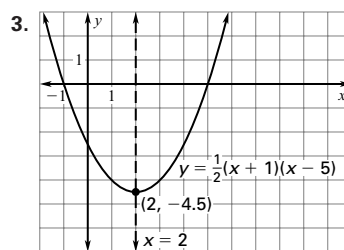
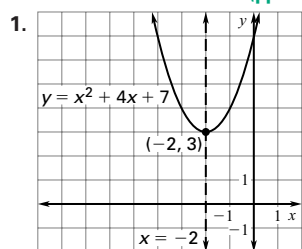
41. 5 43. -182 45. (3, -1) 47. (-4, 5)

QUIZ 3 (p. 312)



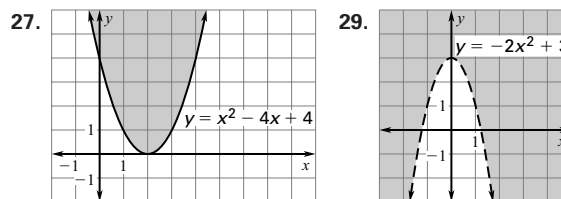
10. $0.00339N^2 + 0.00143N - 5.95 < 1000; 0 < N < 544$

CHAPTER 5 REVIEW (pp. 314-316)



5. 4 7. $-3, \frac{5}{3}$
 9. -10, 10
 11. $-6 - 2\sqrt{10}, -6 + 2\sqrt{10}$
 13. $5 + i$ 15. $102 + 13i$
 17. $3\sqrt{13}$ 19. $5 + i, 5 - i$
 21. $y = (x - 4)^2 + 1; (4, 1)$

23. $y = 4(x + 2)^2 + 7; (-2, 7)$ 25. $-\frac{7}{18} - \frac{\sqrt{85}}{18}, -\frac{7}{18} + \frac{\sqrt{85}}{18}$



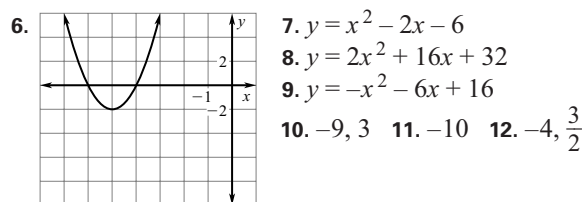
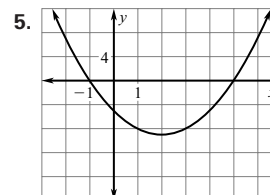
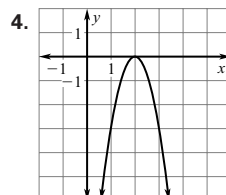
31. $x \leq \frac{-7 - \sqrt{33}}{4}$ or $x \geq \frac{-7 + \sqrt{33}}{4}$ 33. $y = (x - 6)^2 + 1$

35. $y = 0.5x^2 + 1.5x - 4$

CHAPTER 6

SKILL REVIEW (p. 322) 1. $3x^2 - x$ 2. $-3x + 10$

3. $-5x^4 - 4x^3 + 7x^2$



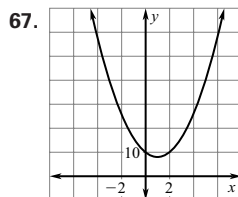
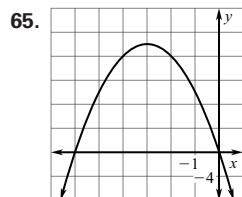
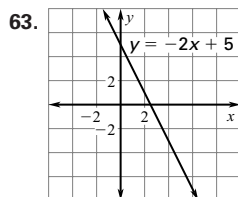
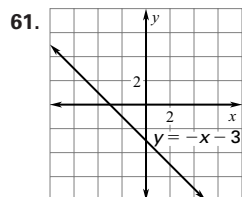
6.1 PRACTICE (pp. 326-328) 3. 216 5. 64 7. $\frac{25}{9}$ 9. 1

11. $\frac{1}{16x^6}$ 13. $3y^3$ 15. sun's volume: $1.41 \times 10^{18} \text{ km}^3$;
 Earth's volume: $1.09 \times 10^{12} \text{ km}^3$; ratio is about 1,298,000;
 the results match. 17. $\frac{1}{15,625}$ 19. 262,144 21. $\frac{27}{343}$
 23. $\frac{1}{121}$ 25. 4096 27. 2048 29. $\frac{1}{6}$ 31. $\frac{15,625}{64}$
 33. $32,768x^{10}$ 35. x^7 37. $\frac{1}{x^{12}y^{21}}$ 39. $-\frac{3}{x^4}$ 41. $\frac{y^3}{x^2}$
 43. $\frac{1}{3}xy^2$ 45. $-\frac{y^{12}}{9x^4}$ 47. $3x^2y^2$ 49. $A = 16\pi x^2$
 51. $V = \frac{4}{81}\pi x^3$

Country	Per capita GDP
France	$\$2.13 \times 10^4$
Germany	$\$2.24 \times 10^4$
Ireland	$\$1.95 \times 10^4$
Luxembourg	$\$3.24 \times 10^4$
The Netherlands	$\$2.14 \times 10^4$
Sweden	$\$2.00 \times 10^4$

55. about 7.48×10^3 days

6.1 MIXED REVIEW (p. 328)



69. ± 4 71. $\pm \frac{4}{5}$ 73. ± 1 75. $\pm \sqrt{5}$ 77. $\pm \sqrt{3}$ 79. $-3 + 4i$
81. $2 - 7i$ 83. $26 + 12i$

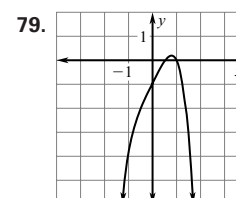
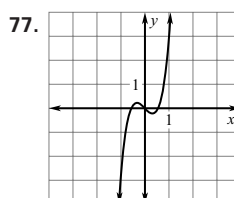
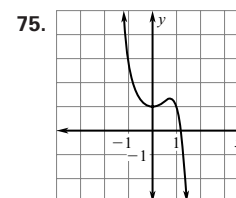
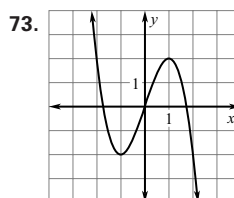
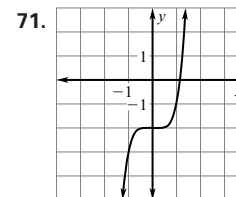
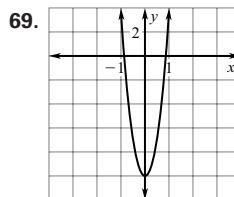
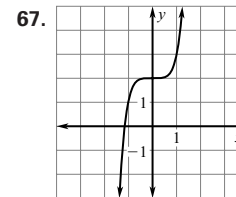
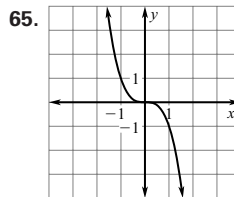
6.2 PRACTICE (pp. 333–336) 5. no 7. yes; -2

9. $f(x) \rightarrow +\infty$ as $x \rightarrow -\infty$ and $f(x) \rightarrow -\infty$ as $x \rightarrow +\infty$
 11. $f(x) \rightarrow -\infty$ as $x \rightarrow -\infty$ and $f(x) \rightarrow +\infty$ as $x \rightarrow +\infty$
 13. $f(x) \rightarrow -\infty$ as $x \rightarrow -\infty$ and $f(x) \rightarrow -\infty$ as $x \rightarrow +\infty$
 15. yes; $f(x) = -5x + 12$, 1, linear, -5 17. yes;
 $f(x) = x + \pi$, 1, linear, 1 19. no 21. yes; $f(x) = x^2 - x + 1$,
 2, quadratic, 1 23. yes; $f(x) = x^4 - x^3 + 36x^2$, 4, quartic, 1
 25. yes; $f(x) = 3x^3$, 3, cubic, 3 27. 4 29. 36 31. 4 33. 2
 35. 7930 37. 73 39. -91 41. -31 43. -7 45. 255

47.

Function	As $x \rightarrow -\infty$	As $x \rightarrow +\infty$
$f(x) = -5x^3$	$f(x) \rightarrow +\infty$	$f(x) \rightarrow -\infty$
$f(x) = -x^3 + 1$	$f(x) \rightarrow +\infty$	$f(x) \rightarrow -\infty$
$f(x) = 2x - 3x^3$	$f(x) \rightarrow +\infty$	$f(x) \rightarrow -\infty$
$f(x) = 2x^2 - x^3$	$f(x) \rightarrow +\infty$	$f(x) \rightarrow -\infty$

49. C 51. B
 53. $f(x) \rightarrow -\infty$ as $x \rightarrow -\infty$ and $f(x) \rightarrow -\infty$ as $x \rightarrow +\infty$
 55. $f(x) \rightarrow -\infty$ as $x \rightarrow -\infty$ and $f(x) \rightarrow +\infty$ as $x \rightarrow +\infty$
 57. $f(x) \rightarrow -\infty$ as $x \rightarrow -\infty$ and $f(x) \rightarrow -\infty$ as $x \rightarrow +\infty$
 59. $f(x) \rightarrow +\infty$ as $x \rightarrow -\infty$ and $f(x) \rightarrow -\infty$ as $x \rightarrow +\infty$
 61. $f(x) \rightarrow +\infty$ as $x \rightarrow -\infty$ and $f(x) \rightarrow +\infty$ as $x \rightarrow +\infty$
 63. $f(x) \rightarrow +\infty$ as $x \rightarrow -\infty$ and $f(x) \rightarrow -\infty$ as $x \rightarrow +\infty$



81. about 4272.9 million ft^2 83. $f(x) \rightarrow -\infty$ as $x \rightarrow -\infty$ and $f(x) \rightarrow -\infty$ as $x \rightarrow +\infty$; less; the graph will tend to go down over time. 85. $f(x) \rightarrow +\infty$ as $x \rightarrow -\infty$ and $f(x) \rightarrow +\infty$ as $x \rightarrow +\infty$; more; the graph will tend to go up over time.

- 6.2 MIXED REVIEW (p. 336)** 91. $7x$ 93. $x^2 + 4x - 11$
 95. $-x^2 - x + 2$ 97. $y = -2x^2 - 2x + 60$ 99. $y = 4x^2 - 24x + 12$ 101. $y = -3x^2 + 30x - 72$ 103. $\pm \sqrt{5}i$ 105. $\pm \sqrt{3}i$
 107. $\pm \frac{\sqrt{6}}{6}i$ 109. $\pm \frac{\sqrt{10}}{2}i$

TECHNOLOGY ACTIVITY 6.2 (p. 337) 1–7. Ranges may vary.

1. $-10 \leq x \leq 10, -10 \leq y \leq 100$ 3. $-5 \leq x \leq 5, -5 \leq y \leq 10$
 5. $-5 \leq x \leq 5, 0 \leq y \leq 20$ 7. $0 \leq x \leq 16, 0 \leq y \leq 300,000$

- 6.3 PRACTICE (pp. 341–343)** 5. $2x^3 - 5x^2 - 3x + 6$
 7. $-2x^2 + 4x - 2$ 9. $4x^4 + 10x^3 + 27x^2 - 41x - 70$
 11. $-27x^3 + 27x^2 - 9x + 1$ 13. $11x^2 - 1$ 15. $-7x + 7$
 17. $-8x^3 - 4x^2 + x - 4$ 19. $4x^2 - 6x - 21$ 21. $-7x^3 - x^2 + 2x - 11$ 23. $9x^3 - 3x^2 + 3x - 1$ 25. $x^3 + 7x^2 + 8x + 14$
 27. $x^3 + 6x^2 - 7x$ 29. $-4x^3 + 32x^2 - 12x$ 31. $x^2 - 11x + 28$
 33. $x^3 - x^2 - 3x + 27$ 35. $6x^4 + 13x^3 - 3x^2 + 5x$
 37. $x^3 + 6x^2 - 46x + 99$ 39. $x^4 + x^3 - 2x^2 + 2x - 2$
 41. $3x^4 + 12x^3 + 7x^2 - 8x - 6$ 43. $2x^4 + x^3 + 8x^2 - 3x + 4$
 45. $x^3 - 67x + 126$ 47. $-x^3 - 11x^2 - 23x + 35$
 49. $3x^3 - 31x^2 + 32x + 36$ 51. $6x^3 + 29x^2 + 21x + 4$
 53. $x^2 - 49$ 55. $64x^3 - 144x^2 + 108x - 27$ 57. $x^4 - 12x^2 + 36$ 59. $27x^3 + 189x^2 + 441x + 343$ 61. $8x^3 + 36x^2y + 54xy^2 + 27y^3$ 63. $V = 2x^3 + 5x^2 + 3x$

65. $y = -0.8246t^4 + 27.57t^3 - 268.42t^2 + 2797t + 219,260$; about 252 million people
 67. $W = -0.0004128t^5 - 0.03414t^4 + 1.3539t^3 - 12.8387t^2 + 51.9t + 833$; about 1,086,000 degrees
 69. $4000(1+r)^3 + 5000(1+r)^2 + 7000(1+r)$; $10,000r^3 + 43,000r^2 + 72,000r + 39,000$

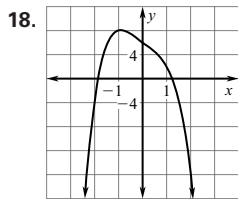
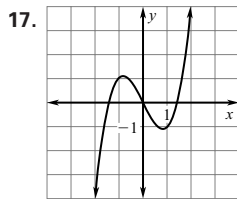
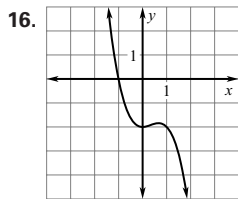
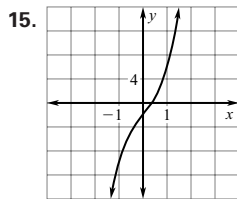
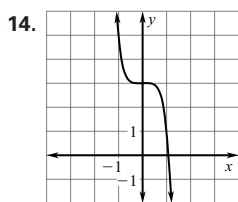
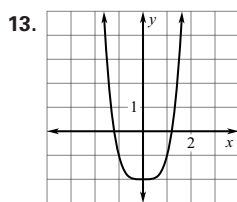
6.3 MIXED REVIEW (p. 344) 73. ± 3 75. -8 77. $-\frac{3}{2}, 5$

79. $y = -\frac{6}{5}x^2 - \frac{12}{5}x + \frac{48}{5}$ 81. $y = \frac{1}{3}x^2 - 12$ 83. x^3

85. $-\frac{1}{25}$ 87. $\frac{1}{2}x^4y^{11}$

QUIZ 1 (p. 344) 1. $\frac{1}{125}$ 2. $\frac{81}{16}$ 3. $\frac{25}{81}$ 4. $\frac{1}{16}$ 5. 1 6. $\frac{1}{648}$

7. $\frac{1}{25}$ 8. $\frac{1}{9x^6y^{12}}$ 9. $\frac{x^7}{y^3}$ 10. $\frac{x^3}{y}$ 11. $\frac{y^6}{8x^3}$ 12. $\frac{x^7}{y^7}$



19. $7x^3 + 3x^2 + 7x - 3$ 20. $3x^2 + 3x - 11$ 21. $2x^2 + 18x - 2$
 22. $x^3 + 3x^2 + 2x - 6$ 23. $4x^3 + 19x^2 - 6x - 5$ 24. $2x^3 + 3x^2 - 17x - 30$ 25. $x^3 - 18x^2 + 108x - 216$ 26. $4x^4 + 12x^2 + 9$ 27. about 1.98×10^4 hours (about 825 days)

6.4 PRACTICE (pp. 348–350) 5. $(x^2 + 5)(x^4 - 5x^2 + 25)$

7. $(x+1)(x-1)(x^2+1)$ 9. $5(x-4)(x^2+4x+16)$ 11. 3

13. $-2, \pm 3$ 15. $\pm \frac{\sqrt{6}}{3}$ 17. 1998 19. $3x^3$ 21. $6x$ 23. 1

25. $3x^3$ 27. C 29. F 31. E 33. $(x-2)(x^2+2x+4)$

35. $(6x+1)(36x^2-6x+1)$ 37. $(10x+3)(100x^2-30x+9)$

39. $4(2x-1)(4x^2+2x+1)$ 41. $(x+1)(x^2+1)$

43. $(x+3)(x^2+10)$ 45. $(2x-5)(x^2+9)$ 47. $(x-2)(3x^2+1)$

49. $(3x-2)(x^2-3)$ 51. $(x^2+1)(x^2+2)$

53. $(3x-4)(3x+4)(9x^2+16)$ 55. $(x^2+2)(x^2+8)$

57. $2x^2(2x-1)(2x+1)(4x^2+1)$ 59. $(2x^2+3)(9x-1)$

61. $(2x+1)(2x-1)(x^2+10)$ 63. $8(x-2)(x^2+2x+4)$

65. $3x(x-2)(x^2+2x+4)$ 67. $x(3x^2+1)(x+3)$ 69. 0, 3

71. -3 73. $-7, 2$ 75. $0, \pm 3$ 77. $\frac{1}{2}$ 79. 5 81. ± 1 83. none

85. $0, \pm 2, \pm \sqrt{2}$ 87. about 3.16 in. by 1.16 in. by 8.16 in.

89. 6 ft by 3 ft by 1 ft 91. base: 5 ft by 5 ft, height: 30 ft

6.4 MIXED REVIEW (p. 351) 99. $\frac{y^{11}}{6}$ 101. y^4 103. 481

6.5 PRACTICE (pp. 356–358) 5. $x^2 + x - 4 + \frac{14}{x+4}$

7. $-x + 2 + \frac{-3x+5}{x^2-1}$ 9. $x^3 - 4x^2 + 1$ 11. $x + 9 + \frac{16}{x-2}$

13. $-2, -1$ 15. $x + 9 + \frac{13}{x-2}$ 17. $2x - 5 + \frac{19}{x+4}$

19. $x + 15 + \frac{147}{x-10}$ 21. $2x^2 + 2 + \frac{9}{x^2-1}$ 23. $3x - 4 + \frac{5}{2x+3}$

25. $5x^2 - x + 3$ 27. $x^2 + 2x - 3 - \frac{12}{x-2}$ 29. $4x + 1 - \frac{5}{x+1}$

31. $2x + 11 + \frac{30}{x-2}$ 33. $x - 4 + \frac{26}{x+4}$ 35. $10x^3 - 5x^2 + 9x - 9$

37. $2x^3 + x - \frac{3}{x-3}$ 39. $(x+2)(x-3)(x-4)$

41. $(x-10)(x-4)(x+2)$ 43. $(x+5)(x-3)^2$

45. $(x-1)(2x+3)(2x-3)$ 47. $-\frac{1}{9}, 1$ 49. $-5, -\frac{1}{2}$

51. $\frac{5 \pm \sqrt{17}}{2}$ 53. $1 \pm i\sqrt{7}$ 55. $3x - 10$ 57. $(-2, 6), (-1, 5),$

$(1, -3)$ 59. $5x^3 - 3x^2 + 21x - 8$; I multiplied $5x^2 - 13x + 47$ by $x + 2$ and added -102 . 61. Answers may vary depending

on rounding. $C = 0.0031x^2 + 0.1578x + 11.155 + \frac{6398}{8.4x - 580}$; about 144 million cars

6.5 MIXED REVIEW (p. 358) 67. Both are solutions.

69. $(1, 4)$ is a solution, but $(2, 0)$ is not a solution.

71. $4 \pm \sqrt{13}$ 73. $\frac{7 \pm \sqrt{33}}{8}$ 75. $\frac{-1 \pm \sqrt{41}}{10}$ 77. $\frac{-1 \pm i\sqrt{159}}{10}$

79. $-4x + 9$ 81. $-14x^3 - 2x^2 + x + 4$ 83. 82 guests

6.6 PRACTICE (pp. 362–364) 5. $\pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 8, \pm 9,$

$\pm 12, \pm 18, \pm 24, \pm 36, \pm 72$ 7. $\pm 1, \pm 2, \pm 5, \pm 10, \pm \frac{1}{5}, \pm \frac{2}{5}$

9. $-4, -1, 1$ 11. $-3, \frac{3}{2}, 2$ 13. $-5, -1, 1$ 15. $\pm 1, \pm 2, \pm 3,$

$\pm 4, \pm 6, \pm 8, \pm 12, \pm 24$ 17. $\pm \frac{1}{2}, \pm 1, \pm 2, \pm 4, \pm 8, \pm 16$

19. $\pm 1, \pm 2, \pm 5, \pm 10, \pm \frac{1}{2}, \pm \frac{5}{2}, \pm \frac{1}{3}, \pm \frac{2}{3}, \pm \frac{5}{3}, \pm \frac{10}{3}, \pm \frac{1}{6}, \pm \frac{5}{6}$

21. $\pm 1, \pm 3, \pm \frac{1}{2}, \pm \frac{3}{2}, \pm \frac{1}{4}, \pm \frac{3}{4}, \pm \frac{1}{8}, \pm \frac{3}{8}$ 23. $-2, 2$ 25. $-2, -1$

27. $-1, 1$ 29. none 31. $-2, -1, 1, 2$ 33. $-3, 1, 10$

35. $-2, 4, 5$ 37. $-4, 3, 6$ 39. $-1, 2$ 41. $-3, -2, 1, 3$

43. $-3, -2, 3$ 45. $-1, \frac{3}{2}, \frac{5}{2}$ 47. $-2, -1, 1$ 49. $-1, \frac{3}{2}, 2$

51. $-4, \frac{1}{2}, 4$ 53. $-\frac{5}{2}, 1$ 55. $-1, 1$ 57. $-2, -\frac{1}{2}, 2$ 59. 1993

61. 2 in. by 2 in. by 5 in. 63. 5 ft deep, 10 ft wide, 40 ft long

6.6 MIXED REVIEW (p. 365) 71. 3 73. 1 75. 10

77. $y = -\frac{5}{9}(x+3)(x-3)$ 79. $y = -2(x+1)(x-5)$

81. $y = -\frac{1}{63}(x+12)(x+6)$ 83. $y = -\frac{1}{3}(x-4)(x-10)$

85. $y = (x+1)(x+9)$

QUIZ 2 (p. 365) 1. $5(x+3)(x^2-3x+9)$ 2. $6(x+2)(x^2+2)$

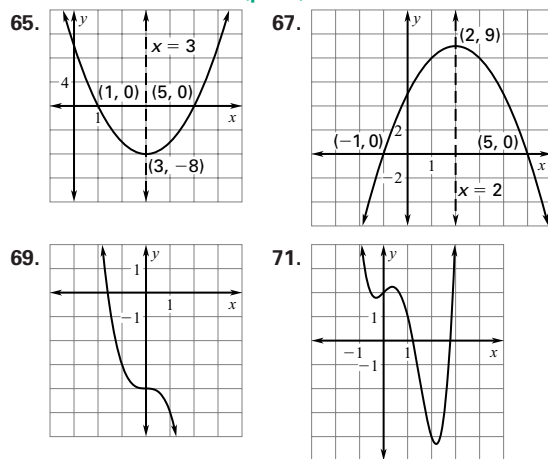
3. $4x(x^2+2)(x^2-2)$ 4. $(x^2-5)(3x-1)$ 5. $0, \pm 6$ 6. $0, \frac{3}{2}$

7. 0, 3 8. $-\frac{5}{2}, -2, 2$ 9. $x + 11$ 10. $x - \frac{10}{3} + \frac{80}{3(3x+2)}$

11. $4x - 7 + \frac{11x - 11}{x^2 - 3}$ 12. $12x^3 - 7x^2 + 10x - 10 + \frac{5}{x + 1}$
 13. $x + \frac{2x^2 + 6x + 6}{x^3 - 3}$ 14. $5x^3 - 23x^2 + 115x - 576 + \frac{2875}{x + 5}$
 15. $\pm\sqrt{7}$, 4 16. 2 17. -5, -3, $\frac{1}{2}$ 18. -6, $\frac{1}{2}$, 2
 19. 16 ft by 16 ft by 0.5 ft

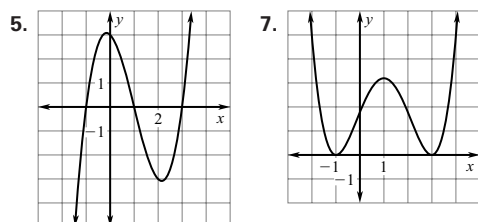
6.7 PRACTICE (pp. 369–371) 5. $\pm\sqrt{3}$, $\pm 2i$ 7. -1, 2, $\pm 2i$
 9. $f(x) = x^4 - 2x^3 + 2x^2 - 2x + 1$ 11. $f(x) = x^5 - 3x^4 - 5x^3 + 15x^2 + 4x - 12$ 13. $f(x) = x^4 + 32x^2 + 256$ 15. yes
 17. no 19. yes 21. -3, -2, -1, 1 23. 0, 1, 3 25. -5, -4, -1, 3
 27. 1, $\pm 7i$ 29. -5, -1, $\pm 3i$ 31. -2, 3, $\pm i$ 33. -3, -1, 3, 4.5
 35. $f(x) = x^3 - 7x^2 + 14x - 8$ 37. $f(x) = x^3 - 2x^2 - 33x + 90$ 39. $f(x) = x^3 + 13x^2 + 50x + 56$ 41. $f(x) = x^3 - 5x^2 + 9x - 45$
 43. $f(x) = x^4 + 10x^2 + 9$ 45. $f(x) = x^4 - 12x^3 + 53x^2 - 104x + 80$ 47. -2.09, 0.57, 2.51 49. -0.47
 51. -1.27, 2.86 53. -0.75, 0.75 55. 1988 57. Yes; there were 2 such years, 1988 and 1993, because the graph intersects the line $S = 2000$ when t is about 1.6 and when t is about 6.3. 59. 1965

6.7 MIXED REVIEW (p. 371)

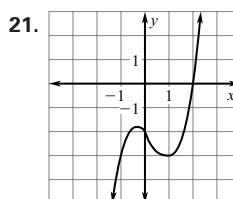
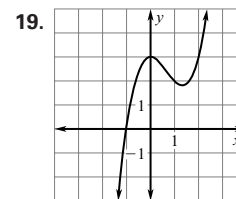
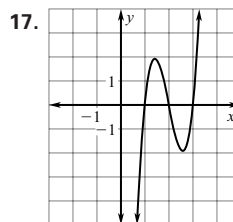
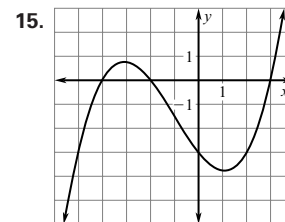
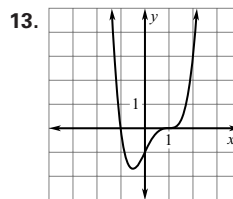


TECHNOLOGY ACTIVITY 6.7 (p. 372) 1. -0.640, 1.135, 5.505 3. 5 5. -2.334, -0.742, 0.742, 2.334
 7. -1.088, -0.668, 1.191 9. -7.349, 16.429, 30.921; yes

6.8 PRACTICE (pp. 376–378)



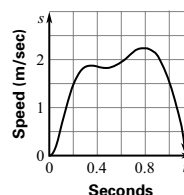
9. x-intercepts: -0.41, 1, 2.41; local maximum: (0.18, 1.09); local minimum: (1.82, -1.09) 11. x-intercepts: 0, 1, 1.51; local maximums: (-1.59, -3.23), (0.49, 1.35); local minimums: (-1, -4), (1.30, -0.79)



23. (-0.5, 0.5) max, (0.5, -0.3) min; -0.9, 0, 0.6; 3
 25. (-2, 1) min, (0, 2) max; 1.4; 3
 27. (-2, -1) max, (0, -2.2) min, (1, -2) max; none; 4

29. x-intercepts: -1.79, 0.11, 1.67; local maximum: (-1, 7); local minimum: (1, -5) 31. x-intercepts: -2.83, 0, 2.83; local maximums: (-2, 4), (2, 4); local minimum: (0, 0)
 33. x-intercepts: -2, -1, 0, 1, 2; local maximums: (-1.64, 3.63), (0.54, 1.42); local minimums: (-0.54, -1.42), (1.64, -3.63)

35. **Speed of Swimmer** ; at about $t = 0.8$ sec into the stroke



37. $l = \frac{600 - \pi r^2}{\pi r}$
 39. 1600 ft³; $r \approx 7.98$ ft, $l \approx 15.97$ ft, or about 16 ft long, 16 ft wide, and 8 ft high

6.8 MIXED REVIEW (p. 378) 45. $y = 7x$ 47. $y = \frac{1}{4}x$

49. $y = -\frac{3}{5}x$ 51. yes; 4×1 53. no 55. $y = -(x - 1)^2 + 4$
 57. $y = \frac{5}{24}(x + 5)(x - 5)$ 59. 10 in./day

6.9 PRACTICE (pp. 383–385)

5. $f(1)$ $f(2)$ $f(3)$ $f(4)$ $f(5)$ $f(6)$

4	17	40	73	116	169	Values
	13	23	33	43	53	First-order differences
		10	10	10	10	Second-order differences

7. $f(1)$ $f(2)$ $f(3)$ $f(4)$ $f(5)$ $f(6)$

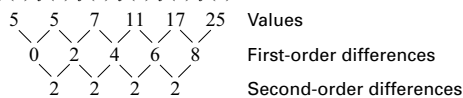
3	20	87	264	635	1308	Values
	17	67	177	371	673	First-order differences
		50	110	194	302	Second-order differences
			60	84	108	Third-order differences
				24	24	Fourth-order differences

9. 3 11. $f(x) = -x^3 + 5x^2 + x + 1$ 13. $d(n) = \frac{1}{2}n^2 - \frac{3}{2}n$
 15. $f(x) = -\frac{1}{2}(x + 1)(x - 2)(x - 3)$ 17. $f(x) = -\frac{1}{2}x(x + 1)(x + 2)$

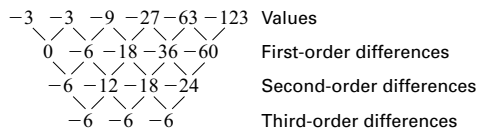
19. $f(x) = -\frac{1}{4}(x-1)(x-3)(x+2)$

21. $f(x) = (x-3)(x-2)(x+1)$

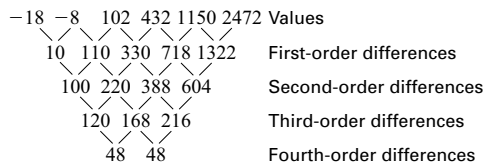
23. $f(1) f(2) f(3) f(4) f(5) f(6)$



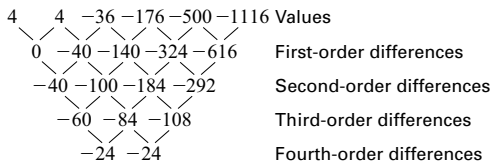
25. $f(1) f(2) f(3) f(4) f(5) f(6)$



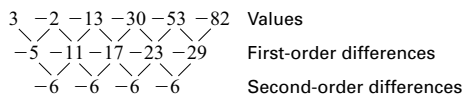
27. $f(1) f(2) f(3) f(4) f(5) f(6)$



29. $f(1) f(2) f(3) f(4) f(5) f(6)$



31. $f(1) f(2) f(3) f(4) f(5) f(6)$



33. $f(x) = -3x^2 + 20x$ 35. $f(x) = x^3 - 4x^2 + x$

37. $f(x) = x^3 + 4x^2 - x - 2$ 39. $y = 2x^3 - 16x^2 + 37x - 25$

41. $f(x) = -x^3 + 10x^2 - 30x + 23$ 43. $f(x) = -x^4 + 13x^3 - 58x^2 + 104x - 58$

47. $f(t) = 0.641t^3 - 4.93t^2 + 25.8t + 232$ where t is the number of years since 1989; 772,000 Girl Scouts

49. $y = 0.007t^3 - 0.740t^2 + 49.0t - 236$; about 101 sec

6.9 MIXED REVIEW (p. 386) 53. $\pm \frac{1}{2}$ 55. $\pm \frac{\sqrt{78}}{6}$ 57. $\pm \frac{\sqrt{2}}{2}$

59. $-3 \pm \sqrt{33}$ 61. $-2 \pm \frac{i\sqrt{6}}{2}$ 63. $3 \pm \frac{i\sqrt{15}}{3}$

65. $(3x+2)(9x^2-6x+4)$ 67. $(2x-5)(4x^2+10x+25)$

69. $8(x+3)(x^2-3x+9)$ 71. $3(x+3)(x^2-3x+9)$

QUIZ 3 (p. 386) 1. -2.61, -0.74, 3.86 2. -2, $\frac{-1 \pm i\sqrt{3}}{2}$

3. -1, 4, $\pm i\sqrt{2}$ 4. $-\frac{3}{2}, -1, 1, 2$ 5. $y = x^3 + 2x^2 - 4x - 8$

6. $y = x^3 + 2x^2 - 3x$ 7. $y = x^3 - 8x^2 + 21x - 20$

8. $y = x^4 - 7x^3 + 11x^2 - 7x + 10$ 9. $y = x^3 - 8x^2 + 29x - 52$

10. $y = x^4 - 6x^3 + 18x^2 - 24x + 16$

11. local max (0.79, 8.21), local min (-2.12, -4.06)

12. local max (-0.50, 0.56), local min (-1.62, -1), (0.62, -1)

13. local max (2.42, 0.77), local min (3.58, -0.77)

14. local max (-3, 0), local min (-1.67, -1.19) 15. $f(x) =$

$-\frac{1}{3}(x+2)(x+4)(x-2)$ 16. $f(x) = -\frac{1}{70}(x+1)(x-4)(x-2)$

17. $f(x) = x(x-3)(x-5)$ 18. $f(x) = 2(x-1)(x+3)(x+5)$

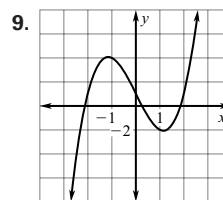
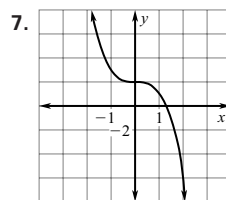
19. $f(x) = x^3 - 3x^2 + x - 4$ 20. $f(x) = x^3 - 4x^2 + 2x$

21. $N = -3.75x^3 + 50.9x^2 - 97.3x + 3210$ where x is the number of years since 1988

CHAPTER 6 REVIEW (pp. 388–390)

1. $\frac{96x^3}{y^3}$; negative exponent, power of a quotient, power of a product, and power of a power property

3. $-\frac{7}{2}x^3y^6$; quotient of powers property 5. 25

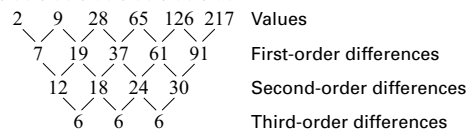


11. $x^3 - 2x^2 - 10x + 21$ 13. -4 15. -3, -1, 1

17. $x^2 + \frac{5}{2} + \frac{33}{2(2x-5)}$ 19. -2, 1

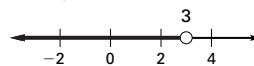
21. ; x-intercepts: 0, 3; local max: (0, 0); local min: (2, -4)

23. $f(1) f(2) f(3) f(4) f(5) f(6)$

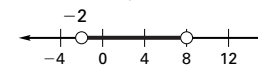


CUMULATIVE PRACTICE (pp. 394–395) 1. -5 3. -4, 8

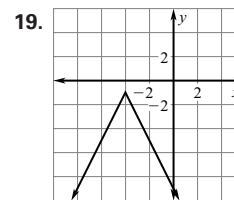
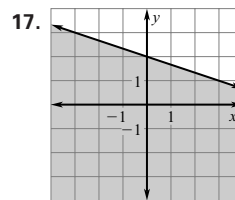
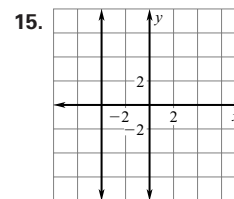
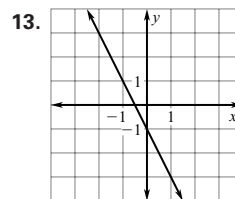
5. $x < 3$;

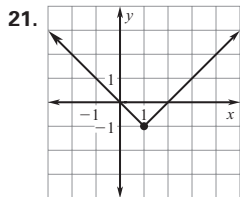


7. $-2 < x < 8$;

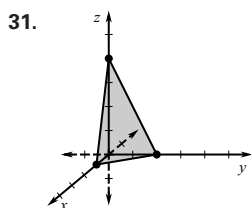


9. 0 11. 4

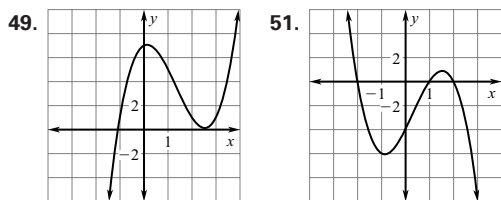
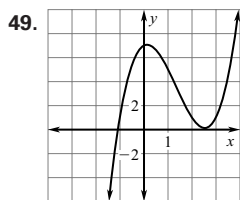
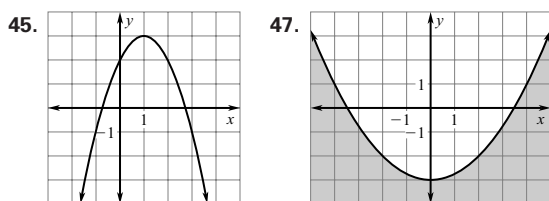
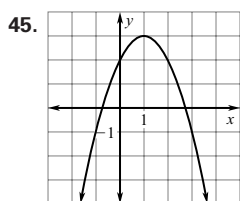




21. $23. y = -4x + 5$ 25. (3, 5)
27. (1, 0, 3)



31. $33. \begin{bmatrix} -11 & 8 \\ 1 & -2 \end{bmatrix}$ $35. \begin{bmatrix} 17 & -7 & -27 \\ 3 & -9 & 69 \end{bmatrix}$
37. 3 39. -55 41. $\begin{bmatrix} 7 & 2 \\ -4 & -1 \end{bmatrix}$
43. no inverse



45. $47.$
49. $51.$
53. $\pm\sqrt{13}$ 55. $\pm 8i$ 57. $-10 \leq x \leq 10$ 59. $\pm 2, \pm 1$
61. $-2, \pm \frac{\sqrt{6}}{2}$ 63. $32 + 20i$ 65. $9 + 2i$ 67. $y = -(x + 3)(x + 2)$
69. $36x^2y^6$ 71. $\frac{16}{25}$ 73. $x^4 - 5x^3 + 11x^2 - 27x + 36$
75. $x^3 - 5x^2 + 18x - 36 + \frac{70}{x+2}$ 77. $\pm\sqrt{5}, \pm\sqrt{5}i$
79. $f(x) = (x + 4)(x + 1)(x - 1)$ 81. $r = \frac{I}{Pt}, 5.5\%$
83. 8 min 85. about 5.45 h

CHAPTER 7

- SKILL REVIEW (p. 400)** 1. $y = \frac{3x - 12}{2}$ 2. $y = 10 - 2x$
3. $y = \frac{x + 1}{4}$ 4. $(x + 7)(x + 3)$ 5. $(x + 9)(x - 4)$
6. $2(x - 3)(x - 5)$ 7. $a^4b^4c^8$ 8. x^2 9. $\frac{x^4}{y^2}$ 10. $\frac{3x^3}{4y^6}$
11. $5x^3 - 40x^2$ 12. $9y^2 - 12y + 4$ 13. $7x^2 - 5x + 4$

- 7.1 PRACTICE (pp. 404–406)** 5. -7 7. 25 9. -1 11. ± 10
13. $14^{1/4}$ 15. $5^{2/7}$ 17. $2^{11/8}$ 19. $\sqrt[4]{7}$ 21. $(\sqrt[5]{5})^2$ 23. ± 10
25. -2 27. none 29. 4 31. -2 33. 1 35. 4 37. 0
39. 16 41. -7 43. 4 45. 0.56 47. 0.0019 49. 1.82
51. 0.087 53. 3 55. 0 57. -1.69 59. -9.24 61. ± 1.40
63. $1247.73 \text{ ft}^3/\text{sec}$ 65. 1.58 ft 67. about 37 species

- 7.1 MIXED REVIEW (p. 406)** 73. $x = 3, y = -4$ 75. $x = \frac{16}{5}$,
 $y = \frac{3}{10}$ 77. $x = \frac{13}{11}, y = -\frac{13}{11}$ 79. $\frac{1}{x^{15}}$; power of a power and

negative exponent properties 81. $\frac{5}{x^2}$; negative exponent and zero exponent properties

83. $\frac{1}{x^4y^2}$; negative exponent and power of a quotient properties 85. $4x^2y$; product of powers and quotient of powers properties 87. -1, 2, 3, -5 89. 1, $\pm 3i$

7.2 PRACTICE (pp. 411–413) 5. 3 7. 4 9. $\frac{2}{3}$ 11. $3\sqrt[3]{8}$

13. x^2 15. $2a^3$ 17. $\frac{x^2}{y}$ 19. $-4a^{1/5}$ 21. 1333.78 cm^2
23. $5^{1/3}$ 25. 6 27. $5^{1/3}$ 29. $\frac{8}{5}$ 31. $5^{3/4}$ 33. $\frac{1}{64,000}$
35. 2 37. $6^7 = 279,936$ 39. $\frac{1}{2}$ 41. 3 43. $3\sqrt[5]{5}$ 45. $30\sqrt[4]{3}$
47. $\frac{2\sqrt[3]{3}}{3}$ 49. $\sqrt[15]{2}$ 51. $-2\sqrt[7]{5}$ 53. $3\sqrt{10}$ 55. $9\sqrt[4]{11}$
57. $y^{1/2}$ 59. $x^{5/4}$ 61. $\frac{x^3}{y}$ 63. $y^{5/3}$ 65. $\frac{x^{1/2}y}{z}$ 67. $\frac{1}{3y^2}$
69. $xy^2z^2\sqrt[4]{10xz^2}$ 71. $y^2z^2\sqrt{2xz}$ 73. $\frac{x\sqrt[3]{y}}{y}$ 75. $x^{1/35}$
77. $7x^{1/5}$ 79. $2x^3y^{1/3}$ 81. $(2x - 1)y\sqrt[3]{3x^2}$ 83. y^2
85. $\frac{1}{4\sqrt[7]{7}}$ 87. $\frac{x}{y^2}$ 89. $-2xy\sqrt{11}$ 91. $\frac{\sqrt{3}}{2}$ 93. 0.45 mm
95. Higher notes have frequencies twice as high as lower notes of the same letter. 97. $2^{2/3}$

7.2 MIXED REVIEW (p. 414) 101. $\frac{441}{4}, (x - \frac{21}{2})^2$

103. 24.5025, $(x + 4.95)^2$ 105. $\frac{1}{64}, (x - \frac{1}{8})^2$
107. $8x^3 + 9x^2 + 52x + 1$ 109. $4x^2 + 28x + 49$
111. $(4x - 1) - \frac{2}{x + 1}$ 113. $x^3 + 3x^2 + 15x + 5 + \frac{45}{x - 5}$

- QUIZ 1 (p. 414)** 1. 4 2. $\frac{1}{8}$ 3. -3 4. 16 5. 1.58 6. ± 1.12
7. ± 1.90 8. -4.47 9. $4^{1/4}$ or $2^{1/2}$ 10. $\frac{2\sqrt[4]{27}}{3}$ 11. 4
12. $3\sqrt{5}$ 13. 7 14. $3\sqrt[5]{8}$ 15. $x^{11/12}$ 16. $x^{1/2}$ 17. $x^{1/4}y^{5/2}$
18. $xy\sqrt[3]{5y^2}$ 19. $\frac{6\sqrt{xy}}{y^2}$ 20. $2xy^{1/2}$ 21. about 30,000

horsepower 22. No; The surface area of the Labrador retriever is about 2.08 times the surface area of the Scottish terrier.

- 7.3 PRACTICE (pp. 418–420)** 5. $5x - 1$; all real numbers
7. $4x^2 - 4x$; all real numbers 9. $4x - 4$; all real numbers
11. $g(f(x))$; The bonus is 0.02 times the amount over \$200,000 ($x - 200,000$), so calculate amount first and then take 2%. 13. $2x^2 - 5x + 4$; all real numbers 15. $2x^2 - 8$; all real numbers 17. $5x - 12$; all real numbers 19. 0; all real numbers 21. $6x^{7/6}$; nonnegative real numbers
23. $9x$; nonnegative real numbers 25. $\frac{3}{2x^{1/6}}$; positive real numbers 27. 1; positive real numbers 29. $2^{3/2}x^{-15/4}$; positive real numbers 31. $x^{9/16}$; nonnegative real numbers
33. $9x - 4$; all real numbers 35. $\frac{10x}{x + 4}$; all real numbers