

Chapter 10 answers

10.1

1. $\{-3, 4\}$ 3. $\{14, 3\}$ 5. $\{1/3, -7/2\}$ 7. $\{0, 7\}$ 9. $\{11/3, -11/3\}$ 11. $\{4, -3/7\}$
 13. $\{-8, 8\}$ 15. $\{0, 2/5, 1/3\}$ 17. $\{6, -1\}$ 19. $\{15, -1\}$ 21. $\{1, -3\}$
 23. $\{12, -13\}$ 25. $\{6, 1\}$ 27. $\{9, -17\}$ 29. $\{1/2, -5/6\}$ 31. $x^2 - 3x + 2 = 0$
 33. $x^2 - x - 2 = 0$ 35. $x^2 - 16 = 0$ 37. $x^2 + 7x + 12 = 0$ 39. $8x^2 + 6x + 1 = 0$
 41. $20x^2 + 11x - 4 = 0$ 43. $8x^2 + 9x + 1 = 0$ 45. $15x^2 + 11x + 2 = 0$
 47. $x^2 - 2 = 0$ 49. $x^2 - 4x + 1 = 0$ 51. $\{\pm 2\}$ 53. $\{4, -2\}$ 55. $\{-3 \pm \sqrt{7}\}$
 57. $\{3 \pm 2\sqrt{3}\}$ 59. $\{2 \pm 3i\}$ 61. $\{-9, -5\}$ 63. $\{0, -2\}$ 65. $\{3, 1\}$ 67. $\{3\}$
 69. $\{-6 \pm 2i\}$ 71. $\{0, 1\}$ 73. $\{0, 2/3\}$ 75. $\{3 \pm 2\sqrt{3}\}$ 77. $\{7, 1\}$ 79. $\{1/3 \pm \frac{\sqrt{2}}{3}i\}$

10.2

1. $x^2 - 4x + 4, (x-2)^2$ 3. $y^2 + 8y + 16, (y+4)^2$ 5. $x^2 + 3x + \frac{9}{4}, (x + \frac{3}{2})^2$
 7. $t^2 - \frac{1}{2}t + \frac{1}{16}, (t - \frac{1}{4})^2$ 9. $x^2 + \frac{2}{5}x + \frac{1}{25}, (x + \frac{1}{5})^2$ 11. $\{5, -1\}$
 13. $\{-4 \pm \sqrt{17}\}$ 15. $\{-\frac{3}{2} \pm \frac{\sqrt{5}}{2}\}$ 17. $\{\frac{1}{4} \pm \frac{\sqrt{31}}{4}i\}$ 19. $\{-\frac{1}{5}\}$
 21. $\{1 \pm \frac{\sqrt{2}}{2}\}$ 23. $\{-3 \pm \frac{\sqrt{87}}{3}\}$ 25. $\{0, 2\}$ 27. $\{2 \pm i\}$ 29. $\{-\frac{1}{2} \pm \frac{\sqrt{7}}{2}i\}$
 31. $\{-\frac{3}{8} \pm \frac{\sqrt{129}}{24}\}$ 33. $\{-\frac{3}{2} \pm \frac{\sqrt{41}}{2}\}$ 35. $\{-2 \pm 2\sqrt{3}\}$ 37. $\{\frac{15}{4} \pm \frac{\sqrt{505}}{4}\}$
 39. $\{\frac{3}{4} \pm \frac{\sqrt{23}}{4}i\}$ 41. $\{-4, \frac{7}{2}\}$ 43. $\{1 \pm \sqrt{2}\}$ 45. $\{-1, -\frac{1}{2}\}$ 47. $\{\frac{5}{8} \pm \frac{\sqrt{185}}{8}\}$
 49. $\{\frac{21}{5}, \frac{9}{5}\}$ 51. $\{2 \pm \frac{3\sqrt{2}}{2}\}$ 53. $\{-5, 10\}$ 55. $\{\frac{5}{6} \pm \frac{\sqrt{91}}{6}\}$ 57. $\{3, 0\}$

10.3

1. 2 real solutions 3. 2 complex solutions 5. 2 real solutions 7. 1 real solution
 9. 2 complex solutions 11. $\{3 \pm \sqrt{11}\}$ 13. $\{-2 \pm 2\sqrt{3}\}$ 15. $\{\frac{5}{4} \pm \frac{\sqrt{41}}{4}\}$ 17. $\{-\frac{5}{4} \pm \frac{\sqrt{41}}{4}\}$
 19. $\{\frac{2}{3}, \frac{3}{2}\}$ 21. $\{\frac{3}{10} \pm \frac{\sqrt{31}}{10}i\}$ 23. $\{1 \pm \frac{\sqrt{15}}{3}\}$ 25. $\{1 \pm 2i\sqrt{3}\}$ 27. $\{1 \pm \sqrt{5}\}$
 29. $\{\frac{1}{2} \pm \frac{\sqrt{5}}{2}\}$ 31. $\{4, 2\}$ 33. $\{1, \frac{1}{2}\}$ 35. $\{\frac{3}{20} \pm \frac{\sqrt{71}}{20}i\}$ 37. $\{\frac{50}{21} \pm \frac{\sqrt{2038}}{21}\}$
 39. $\{\frac{3}{8} \pm \frac{\sqrt{105}}{8}\}$ 41. $\{9 \pm 3\sqrt{10}\}$ 43. $\{\frac{10}{3} \pm \frac{\sqrt{97}}{3}\}$ 45. $\{-4, \frac{7}{2}\}$ 47. $\{-2, -\frac{3}{2}\}$
 49. $\{3 \pm 5\sqrt{10}\}$ 51. $\{-1 \pm \frac{3\sqrt{3}}{2}\}$ 53. $\{18, -\frac{3}{2}\}$ 55. $s = \pm \sqrt{\frac{A}{6}}$
 57. $c = \pm \sqrt{d^2 - a^2 - b^2}$ 59. $k = \frac{3 \pm \sqrt{8N+9}}{2}$ 61. $n = \frac{1 \pm \sqrt{8N+1}}{2}$
 63. $T = \frac{1 \pm \sqrt{24A+1}}{6}$ 65. $x = h \pm \sqrt{r^2 - (y-k)^2}$ 67. $x = h \pm \sqrt{\frac{y-k}{a}}$

10.4

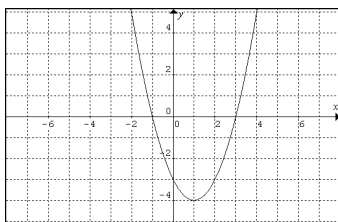
1. $\{\pm 3, \pm 4\}$ 3. No solution 5. $\{343, 1\}$ 7. $\{1/3\}$ 9. $\{1/4\}$ 11. $\{\pm \frac{1}{2}, \pm 1\}$
 13. $\{\frac{2401}{16}, \frac{1}{81}\}$ 15. $\{1\}$ 17. $\{3^{2/3}\}$ 19. $\{1\}$ 21. $\{\pm i\sqrt{3}, \pm i\}$
 23. $\{8 + 2\sqrt{7}\}$ 25. $\{\frac{3 \pm \sqrt{5}}{4}\}$ 27. $\{\pm \sqrt{\frac{7 \pm \sqrt{29}}{10}}\}$ 29. $\{(\frac{1 \pm \sqrt{22}}{3})^3\}$ 31. $\{\pm \sqrt{3}, \pm i\sqrt{2}\}$

33. $\{-3/4, 2\}$ 35. $\{4\}$ 37. $\{-5/2\}$ 39. $\{1 \pm i\sqrt{3}, \frac{1}{2} \pm \frac{\sqrt{3}}{2}i, 1, -2\}$ 41. $\{4\}$
 43. $\{-3, -5\}$ 45. $\{6\}$ 47. $\{4\}$ 49. $\{-1\}$ 51. No solution 53. $\{2, 6\}$
 55. $\left\{\frac{1 \pm \sqrt{61}}{2}\right\}$ 57. $\{22 + 4\sqrt{29}\}$ 59. $\{0\}$ 61. $\{-2, -3\}$ 63. $\{4, -3/2\}$ 65. $\{6, -1\}$
 67. $\{-2\}$ 69. $\{4\}$ 71. $\{-2\}$ 73. $\{\pm i\}$ 75. $\{0\}$ 77. $\{\pm i\sqrt{3}\}$
 79. $\left\{-\frac{1}{10} \pm \frac{\sqrt{29}}{10}i\right\}$

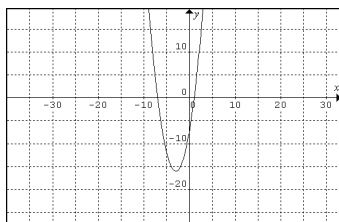
10.5

1. vertex: (1, -1), axis of sym: $x = 1$, min value of -1, x-int: 0, 2, y-int: 0
 3. vertex: (-2, 0), axis of sym: $x = -2$, max value of 0, x-int: -2, y-int: -4
 5. vertex: (2, 1), axis of sym: $x = 2$, min value of 1, x-int: none, y-int: 13
 7. vertex: (0, 4), axis of sym: $x = 0$, min value of 4, x-int: none, y-int: 4
 9. vertex: (-4, 2), axis of sym: $x = -4$, min value of 2, x-int: none, y-int: 18
 11. vertex: $(-1/2, 1)$, axis of sym: $x = -1/2$, max value of 1, x-int: $1/2, -3/2$, y-int: $3/4$
 13. vertex: $(3/2, 18)$, axis of sym: $x = 3/2$, max value of 18, x-int: $9/2, -3/2$, y-int: $27/2$
 15. vertex: (3, 6), axis of sym: $x = 3$, max value of 6, x-int: $3 \pm 2\sqrt{3}$, y-int: $3/2$
 17. vertex: $(-3, -3/2)$, axis of sym: $x = -3$, min value of $-3/2$, x-int: $-3 \pm \frac{\sqrt{3}}{2}$, y-int: $33/2$
 19. vertex: $(2/3, 1/27)$, axis of sym: $x = 2/3$, max value of $1/27$, x-int: 1, $1/3$, y-int: $-1/9$

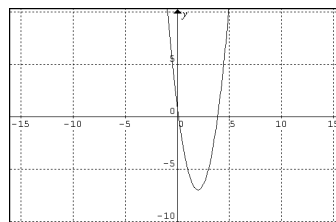
21. vert: (1, -4), min of -4
 x-int: 3, -1, y-int: -3



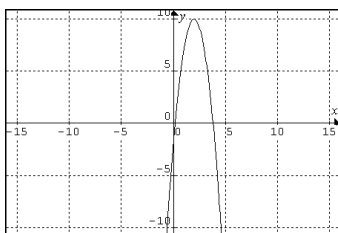
23. vert: (-3, -16), min of -16
 x-int: 1, -7, y-int: -7



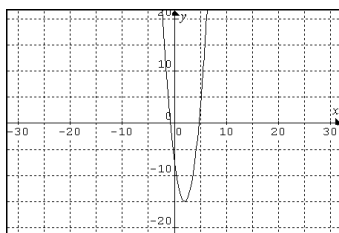
25. vert: (2, -7), min of -7
 x-int: $\frac{4 \pm \sqrt{14}}{2}$, y-int: 1



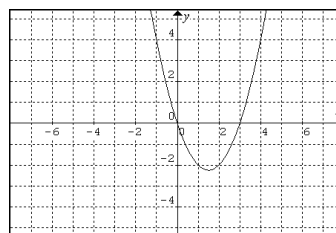
27. vert: (2, 10), max of 10
 x-int: $\frac{6 \pm \sqrt{30}}{3}$, y-int: -2



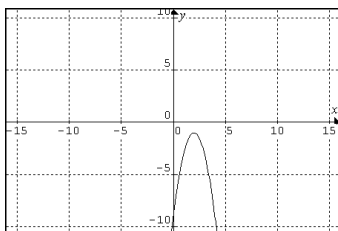
29. vert: (2, -15), min of -15
 x-int: $\frac{4 \pm \sqrt{30}}{2}$, y-int: -7



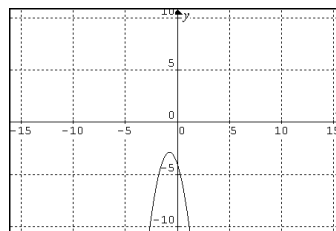
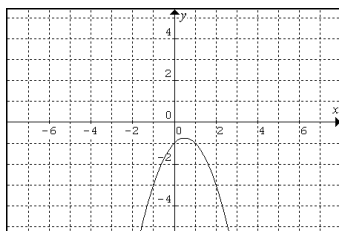
31. vert: $(3/2, -9/4)$, min of $-9/4$
 x-int: 0, 3, y-int: 0



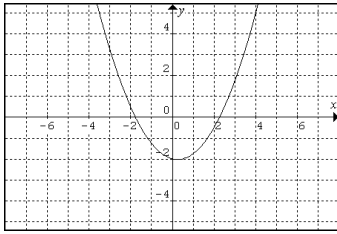
33. vert: (2, -1), max of -1
 x-int: none, y-int: -9



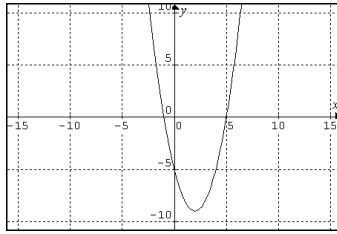
35. vert: $(1/2, -3/4)$, max of $-3/4$ 37. vert: $(-3/4, -23/8)$
 max of $-23/8$
 x-int: none, y-int: -1 x-int: none, y-int: -4



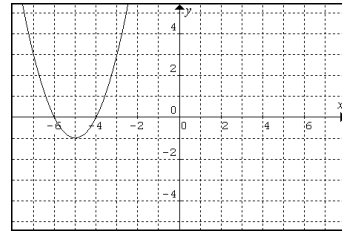
39. vert: $(\frac{1}{4}, -\frac{65}{32})$, min of $-\frac{65}{32}$
 x-int: $\frac{1 \pm \sqrt{65}}{4}$, y-int: -2



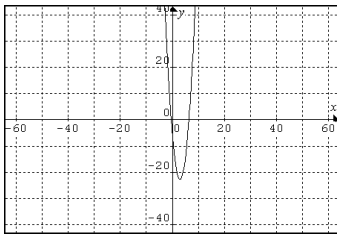
41. vert: (2, -9), min of -9
 x-int: 5, -1, y-int: -5



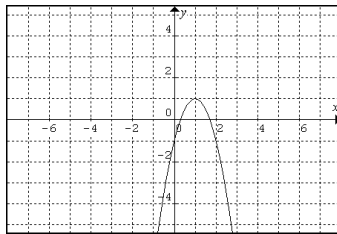
43. vert: (-5, -1), min of -1
 x-int: -6, -4, y-int: 24



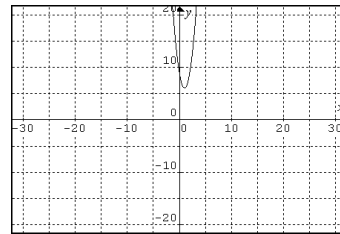
45. vert: (3, -23), min of -23
 x-int: $\frac{6 \pm \sqrt{46}}{2}$, y-int: -5



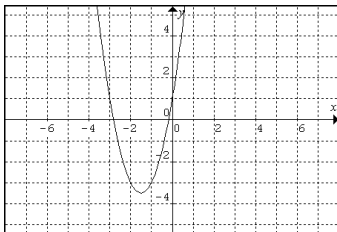
47. vert: (1, 1), max of 1
 x-int: $\frac{2 \pm \sqrt{2}}{2}$, y-int: -1



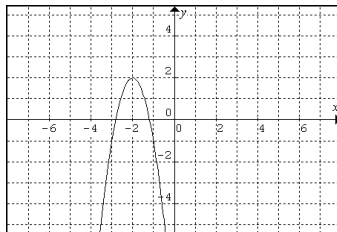
49. vert: (1, 6), min of 6
 x-int: none, y-int: 9



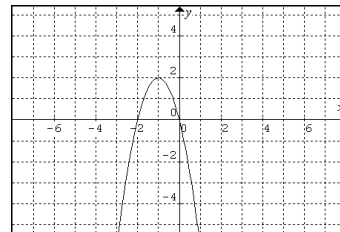
51. vert: $(-\frac{3}{2}, -\frac{7}{2})$, min of $-\frac{7}{2}$
 x-int: $\frac{-3 \pm \sqrt{7}}{2}$, y-int: 1



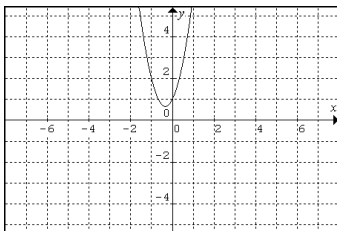
53. vert: (-2, 24), max of 24
 x-int: $\frac{-6 \pm \sqrt{6}}{3}$, y-int: -10



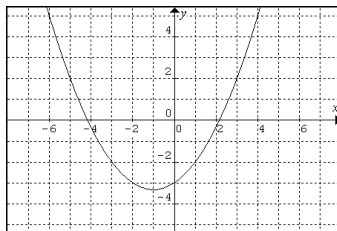
55. vert: (-1, 2), max of 2
 x-int: 0, -2, y-int: 0



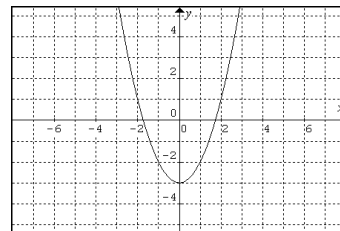
57. vert: $(-\frac{1}{3}, \frac{2}{3})$, min of $\frac{2}{3}$
 x-int: none, y-int: 1



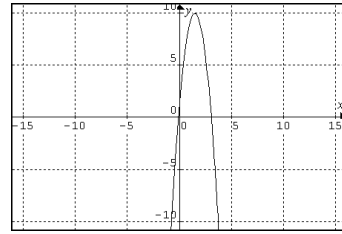
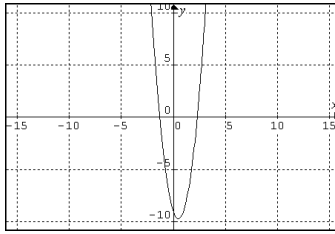
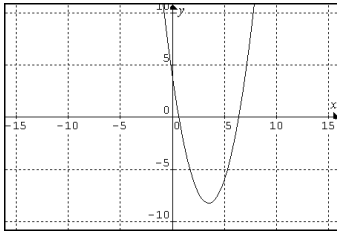
59. vert: $(-1, -\frac{10}{3})$, min of $-\frac{10}{3}$
 x-int: $-1 \pm \sqrt{10}$, y-int: -3



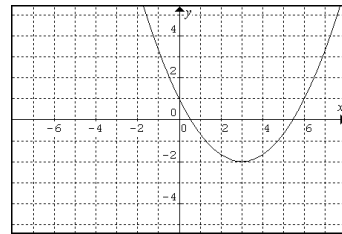
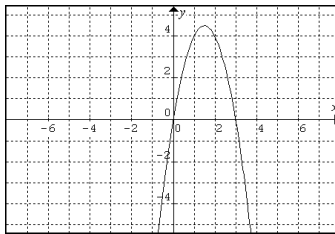
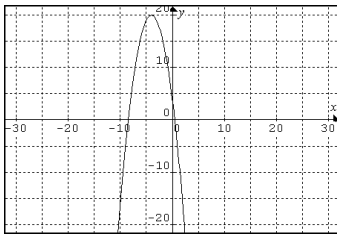
61. vert: (0, -3), min of -3
 x-int: $\pm \sqrt{3}$, y-int: -3



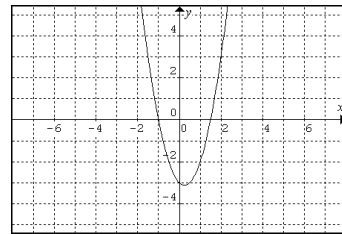
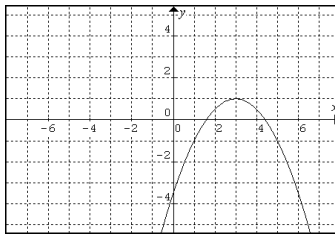
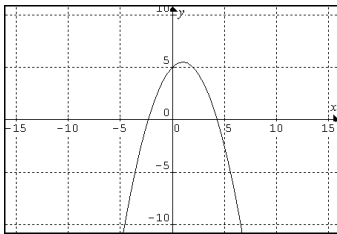
63. vert: $(\frac{7}{2}, -\frac{33}{4})$, min of $-\frac{33}{4}$ x-int: $\frac{7 \pm \sqrt{33}}{2}$, y-int: 4
 65. vert: $(\frac{1}{2}, -\frac{39}{4})$, min of $-\frac{39}{4}$ x-int: $\frac{1 \pm \sqrt{13}}{2}$, y-int: -9
 67. vert: $(\frac{3}{2}, 10)$, max of 10 x-int: $\frac{3 \pm \sqrt{10}}{2}$, y-int: 1



69. vert: (-4, 20), max of 20 x-int: $-4 \pm 2\sqrt{5}$, y-int: 4
 71. vert: $(\frac{3}{2}, \frac{9}{2})$, max of $\frac{9}{2}$ x-int: 0, 3, y-int: 0
 73. vert: (3, -2), min of -2 x-int: $3 \pm \sqrt{6}$, y-int: 1



75. vert: $(1, \frac{11}{2})$, max of $\frac{11}{2}$ x-int: $1 \pm \sqrt{11}$, y-int: 5
 77. vert: (3, 1), max of 1 x-int: $3 \pm \sqrt{2}$, y-int: $-\frac{7}{2}$
 79. vert: $(\frac{1}{4}, -\frac{25}{8})$, min of $-\frac{25}{8}$ x-int: $\frac{3}{2}, -1$, y-int: -3



10.6

1. 85.73 board feet, 0.86 inches 3. 6 teams 5. 500 balls 7. \$5000, \$5000
 9. 1222 units 11. 500 units 13. 1990 15. 10 sec, 256 ft 17. 6 sec, 576 ft
 19. 1.6 sec, 14.8 ft 21. 5 sec, 196 ft 23. 3.8 sec, 50 ft 25. 14 ft, 8.6 ft
 27. 1/2 sec, 2.12 sec 29. 8 ft X 13 ft 31. 20 yds X 30 yds 33. 8 ft base, 5 ft height
 35. 0 37. 2 cm height, 9 cm base; no minimum 39. 12.5 yds X 12.5 yds
 41. 625 ft² 43. 100 ft X 100 ft OR 50 ft X 200 ft; 11,250 ft² 45. 50 yds X 33 1/3 yds
 47. 6666 2/3 m² 49. 20 ft X 40 ft 51. 5 ft X 10 ft 53. 175 ft X 350 ft
 55. $x = \frac{1}{16} mi$, $r = \frac{1}{16\pi} mi$

10.7 No graphs

1. $(-\infty, -3) \cup (2, \infty)$ 3. $[-1, 4]$ 5. $(-\infty, 0] \cup [2, \infty)$ 7. $(-\infty, -5)$
 9. $\{-4\} \cup [6, \infty)$ 11. $(2, 3) \cup (4, \infty)$ 13. $(-2, 1) \cup (1, 2)$ 15. $(-\infty, -1] \cup [3, \infty)$
 17. $[-1, 4]$ 19. $(-\infty, -4) \cup (\frac{3}{2}, \infty)$ 21. $(3, \infty)$ 23. No solution
 25. $(-\infty, 0] \cup [2, \infty)$ 27. $(-\infty, -1] \cup [1, \infty)$ 29. $(-\infty, -1] \cup \{0\} \cup [1, \infty)$
 31. $(-\infty, -1) \cup (0, \infty)$ 33. $[-1, 3)$ 35. $(-2, 2] \cup (3, \infty)$ 37. $(0, 1) \cup (3, \infty)$

39. $(-7, -5] \cup (1, 6]$ 41. $(-\infty, -1) \cup (1, 2] \cup [3, \infty)$ 43. $(-\infty, -1) \cup (-\frac{1}{2}, \infty)$
45. $(5, 15)$ 47. $(-\infty, -6) \cup (0, 4]$ 49. $(-\frac{3}{4}, 3) \cup [6, \infty)$ 51. $(-2, -1) \cup (1, \infty)$
53. $(-\infty, -\frac{13}{2}] \cup (-4, 0] \cup (1, \infty)$ 55. $(-2, 1) \cup [2, 4]$
57. $(-\infty, -4) \cup (-\frac{3}{2}, 1) \cup (4, \infty)$ 59. $(-\infty, -2] \cup (-1, 1) \cup [3, \infty)$
61. $(-\infty, 3) \cup (5, \infty)$ 63. $\{3\}$ 65. $(-\infty, \infty)$ 67. $(-\infty, 0) \cup (1, \infty)$
69. $(-2, 1]$ 71. $(-\infty, -1] \cup (1, \infty)$