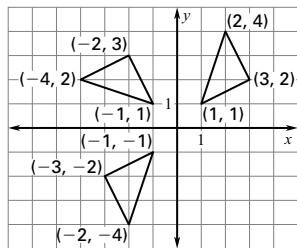


49. a.  $\begin{bmatrix} -1 & -4 & -2 \\ 1 & 2 & 3 \end{bmatrix}; \begin{bmatrix} -1 & -2 & -3 \\ -1 & -4 & -2 \end{bmatrix};$



; 90° rotation

b. *Sample answer:* Find  $A^{-1}$  and then multiply  $AAT$  by  $A^{-1}$  on the left:  $A^{-1}AAT = IAT = AT$ . Now multiply  $AT$  by  $A^{-1}$  on the left:  $A^{-1}AT = IT = T$ .

**4.4 MIXED REVIEW (p. 229)**

55. all real numbers 57.  $(4, 0, -2)$  59.  $(\frac{1}{2}, 4, \frac{1}{4})$

61. Not possible; the matrices have different dimensions.

63.  $\begin{bmatrix} 17 & -3 & -1 \\ 0 & 25 & 31 \end{bmatrix}$  65.  $\begin{bmatrix} 2 & 5 & 1 \\ 3 & 4 & 8 \end{bmatrix}$

**4.5 PRACTICE (pp. 233–235)**

5.  $\begin{bmatrix} 1 & 3 \\ 4 & -2 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 9 \\ 7 \end{bmatrix}$  7.  $(-5, 7)$  9.  $(\frac{21}{13}, -\frac{2}{13})$

11.  $\begin{bmatrix} 1 & 1 \\ 3 & -4 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 5 \\ 8 \end{bmatrix}$  13.  $\begin{bmatrix} 5 & -3 \\ -4 & 2 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 9 \\ 10 \end{bmatrix}$

15.  $\begin{bmatrix} 1 & 8 \\ 4 & -5 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 4 \\ -11 \end{bmatrix}$  17.  $\begin{bmatrix} 1 & -4 & 5 \\ 2 & 1 & -7 \\ -4 & 5 & 2 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} -4 \\ -23 \\ 38 \end{bmatrix}$

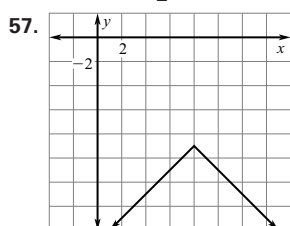
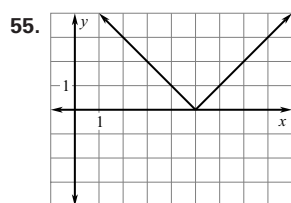
19.  $\begin{bmatrix} 0.5 & 3.1 & -0.2 \\ 1.2 & -2.5 & 0.7 \\ 0.3 & 4.8 & -4.3 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 5.9 \\ 2.2 \\ 4.8 \end{bmatrix}$

21.  $\begin{bmatrix} 0 & 8 & -10 \\ 0 & 6 & -12 \\ -9 & 0 & 5 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} -23 \\ 14 \\ 0 \end{bmatrix}$  23.  $(5, -7)$  25.  $(5, -9)$

27.  $(1, -7)$  29.  $(-1, -4)$  31.  $(-3, -14)$  33.  $(-61, 179, -83)$

35.  $(4, 3, 1)$  37.  $(2, 3, -2)$  39.  $(3, -2, 6)$  41. 2239.8 g of A, 1313.6 g of B, 4067.6 g of C 43. transformer: \$10.00, wire: \$.20 per ft, light: \$1.00

**4.5 MIXED REVIEW (p. 235)** 47.  $-2$  49.  $-\frac{19}{2}$  51. 5 53.  $-3$



61.  $\begin{bmatrix} 3 & 4 \\ 5 & 7 \end{bmatrix}$  65.  $\begin{bmatrix} 1 & -2 \\ 3 & 7 \\ -\frac{3}{2} & \frac{7}{2} \end{bmatrix}$

**QUIZ 2 (p. 236)**

1.  $\begin{bmatrix} 2 & -1 \\ -7 & 4 \end{bmatrix}$  2.  $\begin{bmatrix} -3 & -5 \\ -4 & -7 \end{bmatrix}$  3.  $\begin{bmatrix} -\frac{1}{3} & -\frac{1}{9} \\ -1 & -\frac{2}{3} \end{bmatrix}$  4.  $\begin{bmatrix} 7 & -5 \\ -4 & 3 \end{bmatrix}$

5.  $(-1, 4)$  6.  $(4, 3)$  7.  $(3, -3)$  8. place setting: \$35.50, serving set: \$67.00

**CHAPTER 4 EXTENSION (p. 238)** 1.  $(-2, 5)$  3.  $(-1, -4)$

5.  $(4, -5)$  7.  $(2, 1)$  9.  $(0, \frac{1}{5})$  11.  $(16, -5, 2)$  13.  $(-5, 2, 0)$

15.  $(-16, 12, 10)$

**CHAPTER 4 REVIEW (pp. 240–242)**

1.  $\begin{bmatrix} 15 & -5 \\ 1 & 5 \end{bmatrix}$  3.  $\begin{bmatrix} 8 & 11 \\ 9 & 13 \\ 8 & 6 \end{bmatrix}$  5.  $\begin{bmatrix} 8 & 12 & -2 \\ 20 & -10 & 4 \\ 0 & 22 & 2 \end{bmatrix}$  7.  $x = -1, y = 10$

9.  $x = -1, y = 5$  11.  $\begin{bmatrix} -120 & -84 \\ 40 & 28 \end{bmatrix}$  13.  $\begin{bmatrix} 17 & -29 & 64 \\ 18 & -36 & 72 \end{bmatrix}$

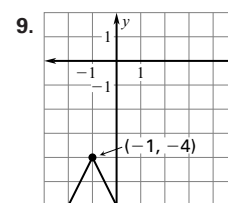
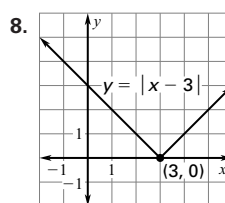
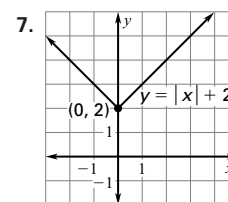
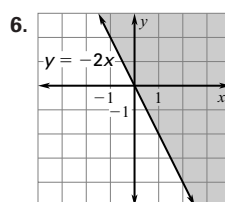
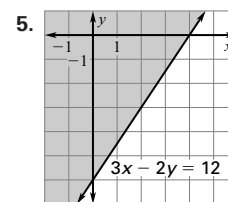
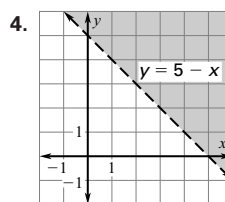
15. 12 17. 4 19.  $(-1, -1)$  21.  $(6, 0, -3)$

23.  $\begin{bmatrix} \frac{3}{4} & -\frac{1}{2} \\ -\frac{1}{4} & \frac{1}{2} \end{bmatrix}$  25.  $\begin{bmatrix} 1 & 1 \\ 5 & 6 \end{bmatrix}$  27.  $\begin{bmatrix} -3 & -2 \\ 4 & 3 \end{bmatrix}$  29.  $(\frac{5}{2}, \frac{3}{2})$

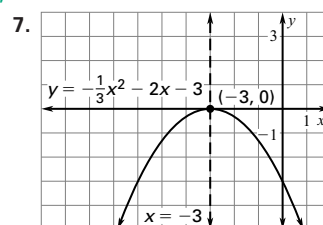
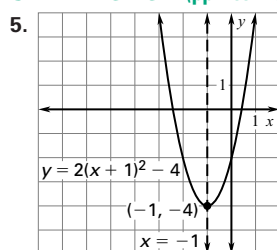
31.  $(4, 1, 0)$  33.  $(-3, 2, 4)$

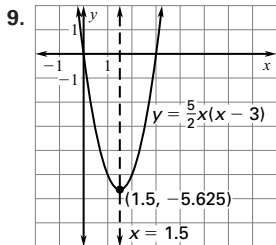
**CHAPTER 5**

**SKILL REVIEW (p. 248)** 1.  $\frac{5}{3}$  2.  $-3$  3. 2

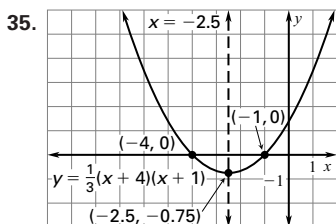
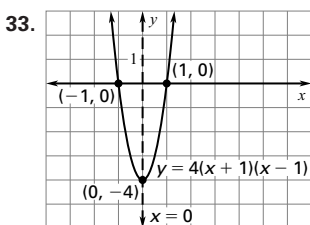
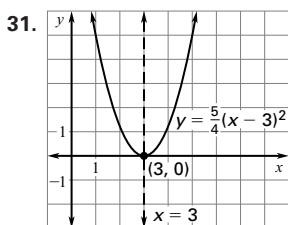
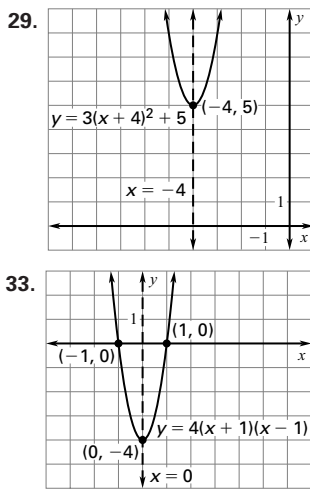
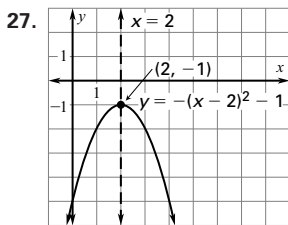
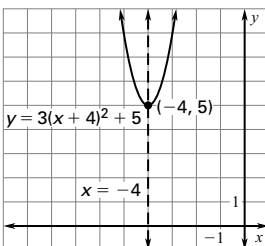
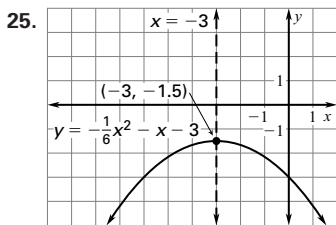
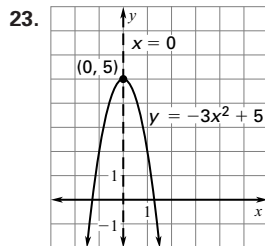
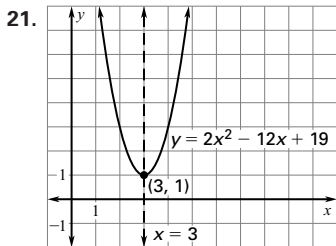


**5.1 PRACTICE (pp. 253–254)**

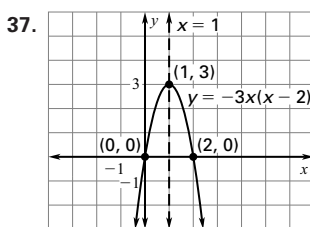




11.  $y = -2x^2 - 2x + 24$   
 13.  $y = -x^2 - 4x - 11$   
 15.  $y = \frac{2}{3}x^2 - 12x + 50$   
 17. C 19. B

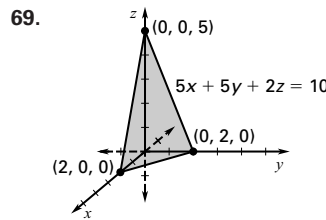
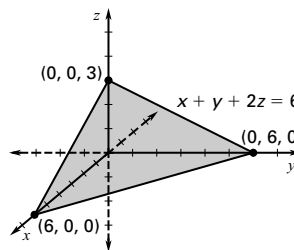


39.  $y = -x^2 + x + 12$   
 41.  $y = -3x^2 + 9x + 84$   
 43.  $y = x^2 + 6x + 11$   
 45.  $y = -6x^2 + 24x - 33$   
 47.  $y = -81x^2 - 32x - 4$   
 49.  $y = 32x^2 - 8x - 1$

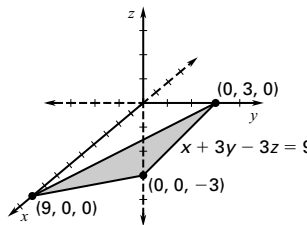


51. about 3,090 revolutions per min; about 74.7 foot-pounds 53. *Sample answer:* The energy use decreases until about 90 meters per minute and then increases.

**5.1 MIXED REVIEW (p. 255)** 57. 2 59. -7 61. -5 63. 7 65. -3 67.



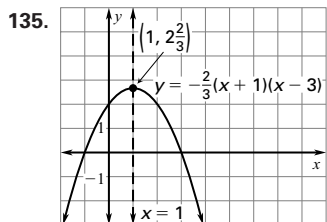
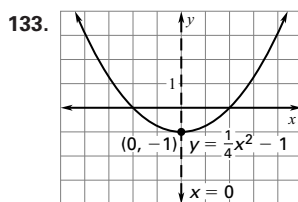
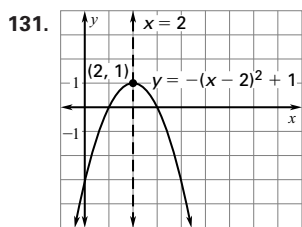
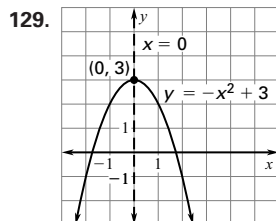
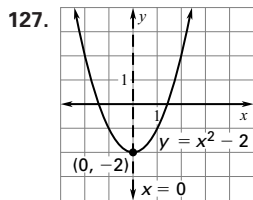
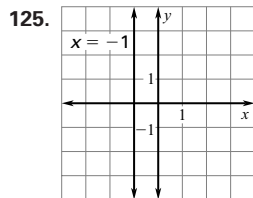
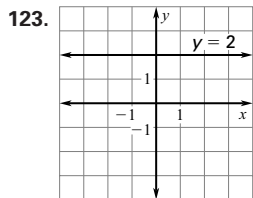
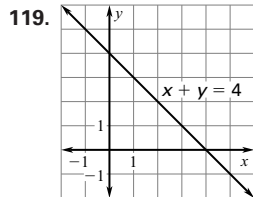
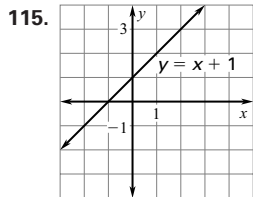
71. 73. (2, 1) 75. (2, -4, 1) 77. (7, 2.5, -0.5)



**5.2 PRACTICE (pp. 260-262)** 5.  $(2x + 3)(x - 1)$  7.  $(y + 1)^2$

9.  $q(q + 1)$  11. -2, 4 13.  $-\frac{1}{2}, \frac{1}{2}$  15. 0, 6  
 17.  $y = (x + 4)(x + 2); -4, -2$  19.  $y = (x + 5)^2; -5$   
 21.  $y = (3x - 2)(x - 2); \frac{2}{3}, 2$  23.  $(x + 4)(x + 1)$   
 25.  $(x + 5)(x + 8)$  27.  $(x - 6)(x - 2)$  29.  $(a + 5)(a - 2)$   
 31.  $(c + 10)(c - 8)$  33. cannot be factored  
 35.  $(2x + 1)(x + 3)$  37.  $(4x + 3)(2x + 3)$  39. cannot be factored  
 41.  $(3k - 1)(k + 11)$  43.  $(3n - 2)(6n + 7)$   
 45.  $(3v - 7)(4v + 1)$  47.  $(x - 5)(x + 5)$  49.  $(x - 3)^2$   
 51.  $(3s + 2)^2$  53.  $(7 - 10a)(7 + 10a)$  55.  $(9c + 11)^2$   
 57.  $2(3x - 1)(3x + 1)$  59.  $4(2y + 3)(y - 5)$  61.  $u(u + 7)$   
 63.  $-(v - 1)^2$  65. -1, 4 67.  $\frac{3}{5}, 2$  69. -12 71.  $-\frac{4}{9}, \frac{4}{9}$   
 73. -5, 6 75.  $\frac{1}{4}$  77. -1,  $\frac{8}{3}$  79.  $-\frac{9}{2}, 0$  81.  $y = (x + 4)(x + 3); -4, -3$   
 83.  $y = (x - 2)(x + 2); -2, 2$  85.  $y = x(x - 3); 0, 3$   
 87.  $y = -(x - 8)^2; 8$  89. a.  $m + n = 0, mn = 9$  b. If  $m + n = 0$ , then  $m = -n$ . Substituting in  $mn = 9$ ,  $(-n)(n) = 9, -n^2 = 9$ , and  $n^2 = -9$ . There is no number such that  $n^2 = -9$ . Therefore,  $x^2 + 9$  is not factorable. 91. 60 ft 93. 7 95. 6  
 97. 2.5 ft 99. \$80; \$12,800 101. about 70 mi; about 24 mi

**5.2 MIXED REVIEW (p. 263)** 107. -4, 8 109. -2, 3, 6 111.  $-4 < x < 2$  113.  $x < -3$  or  $x > 11$



**5.3 PRACTICE (pp. 267–268)** 5.  $2\sqrt{3}$  7. 9 9.  $\frac{\sqrt{7}}{3}$  11.  $\frac{\sqrt{10}}{2}$

13.  $-5, 5$  15.  $-2\sqrt{3}, 2\sqrt{3}$  17.  $-2\sqrt{7} - 8, 2\sqrt{7} - 8$   
 19.  $3\sqrt{2}$  21.  $3\sqrt{3}$  23.  $6\sqrt{2}$  25.  $7\sqrt{2}$  27. 14 29. 6  
 31.  $2\sqrt{6}$  33.  $12\sqrt{7}$  35.  $\frac{1}{3}$  37.  $\frac{6}{5}$  39.  $\frac{\sqrt{3}}{4}$  41.  $\frac{5\sqrt{3}}{6}$   
 43.  $\frac{2\sqrt{3}}{3}$  45.  $\frac{\sqrt{30}}{5}$  47.  $\frac{\sqrt{14}}{4}$  49.  $\frac{3\sqrt{10}}{8}$  51.  $-11, 11$   
 53.  $-6, 6$  55.  $-5\sqrt{3}, 5\sqrt{3}$  57.  $-10\sqrt{3}, 10\sqrt{3}$  59.  $-12, 12$   
 61.  $-6, 4$  63.  $-3\sqrt{3} + 7, 3\sqrt{3} + 7$  65.  $-1, 13$  67.  $-2, 7$   
 69. about 3.3 sec 71. Earth: 3.5 sec; Mars: 5.8 sec; Jupiter: 2.2 sec; Neptune: 3.3 sec; Pluto: 13.8 sec  
 73. 16.2 in. by 21.6 in. 75. a. about 60.6 sec b. 146 sec  
 c. *Sample answer:* The water drains more slowly as the time increases.

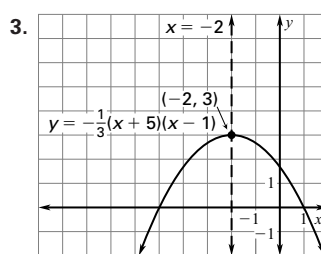
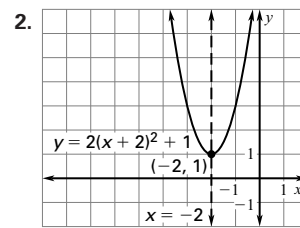
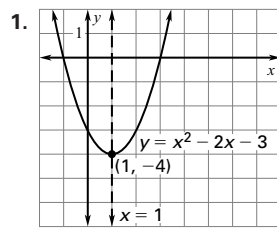
**5.3 MIXED REVIEW (p. 269)** 77. (1, 2) 79.  $(-3, -5)$

81. (6, -2) 83.  $\begin{bmatrix} 13 & -1 \\ -11 & 1 \end{bmatrix}$  85.  $\begin{bmatrix} 81 & 57 \\ -40 & -31 \end{bmatrix}$

87.  $y = x^2 - 9x + 8$  89.  $y = 16x^2 - 81$

91.  $y = 5x^2 + 60x + 168$

**QUIZ 1 (p. 270)**



4.  $-3, 9$  5.  $-4, -\frac{5}{4}$  6.  $\frac{1}{2}$   
 7.  $3\sqrt{6}$  8.  $14\sqrt{5}$   
 9.  $\frac{6\sqrt{5}}{5}$  10.  $\frac{2\sqrt{3}}{3}$   
 11. about 2.7 mi/h

**TECHNOLOGY ACTIVITY 5.3 (p. 271)** 1.  $-1.53, 1.53$

3.  $-2.45, 2.45$  5.  $-2.73, 0.73$  7.  $-3.65, 1.65$

9.  $48\pi = 6\pi r^2$ ;  $r \approx 2.8$  in.

**5.4 PRACTICE (pp. 277–279)** 5.  $-2i\sqrt{2}, 2i\sqrt{2}$  7.  $7 + 3i$

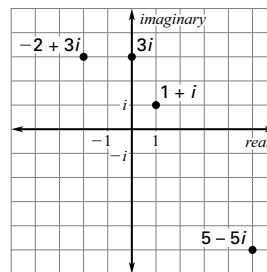
9.  $9 - 5i$  11.  $\sqrt{2}$  13.  $\sqrt{13}$  15.

17.  $-2i, 2i$  19.  $-3i\sqrt{3}, 3i\sqrt{3}$

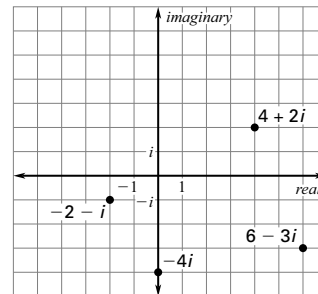
21.  $-i\sqrt{3}, i\sqrt{3}$  23.  $-i, i$

25.  $2 + 4i, 2 - 4i$

27.  $-3 - 2i\sqrt{14}, -3 + 2i\sqrt{14}$



29–35 odd:



37.  $9 + 4i$   
 39.  $-8$   
 41.  $7 + 3i$   
 43.  $0.2 - 0.1i$   
 45.  $3 + 6i$   
 47.  $-1 + 3i$   
 49.  $70 - 40i$   
 51.  $-9 + 23i$   
 53. 74

55.  $161 - 240i$  57.  $-1 + i$  59.  $\frac{4}{5} + \frac{3}{5}i$  61.  $-\frac{87}{97} + \frac{26}{97}i$

63.  $\frac{17}{19} - \frac{6\sqrt{2}}{19}i$  65. 13 67.  $5\sqrt{2}$  69.  $4\sqrt{5}$  71. 4

73. *Sample answer:* It does because the absolute values are equal to or less than  $N = 1$ . 75. *Sample answer:* It does not because the absolute values become infinitely large.

77. *Sample answer:* It does not because the absolute values become infinitely large. 79. *Sample answer:* It does because the absolute values are less than  $N = 1$ .

81. true

83. false; *Sample answer:*  $(6 + 3i) + (-5 - 3i) = 1$ , which is not imaginary. 85. true

87. true; true 89. false; false 91. false; false 95. a.  $2 - 2i$   
b.  $12 - 7i$  c.  $8 - 4i$

**5.4 MIXED REVIEW (p. 280)** 101. 11 103. 3 105. (1, 2)

107. (4, -3) 109. -8, 4 111.  $5 + \sqrt{10}$ ,  $5 - \sqrt{10}$

113.  $6 + \sqrt{7}$ ,  $6 - \sqrt{7}$

**5.5 PRACTICE (pp. 286–289)** 5. 49;  $(x + 7)^2$  7. 25;  $(x - 5)^2$

9.  $\frac{169}{4}$ ;  $(x - \frac{13}{2})^2$  11.  $1 - \sqrt{5}$ ,  $1 + \sqrt{5}$  13.  $-4 - \sqrt{7}$ ,  $-4 + \sqrt{7}$

15.  $2 - 3i\sqrt{3}$ ,  $2 + 3i\sqrt{3}$  17.  $y = (x - 2)^2 + 3$ ; (2, 3)

19.  $y = (x + 5)^2 - 8$ ; (-5, -8) 21.  $y = 2(x + 1)^2 - 6$ ; (-1, -6)

23.  $(x + 8)^2$  25.  $(x - 12)^2$  27.  $(x + 0.5)^2$  29.  $(x - \frac{3}{2})^2$

31.  $(x - \frac{2}{9})^2$  33. 81;  $(x + 9)^2$  35. 484;  $(x - 22)^2$  37.  $\frac{121}{4}$ ;

$(x - \frac{11}{2})^2$  39.  $\frac{225}{4}$ ;  $(x + \frac{15}{2})^2$  41. 8.41;  $(x - 2.9)^2$

43. 22.09;  $(x + 4.7)^2$  45.  $\frac{25}{9}$ ;  $(x + \frac{5}{3})^2$  47.  $-1 + \sqrt{10}$ ,

$-1 - \sqrt{10}$  49.  $-10 + 2i$ ,  $-10 - 2i$  51.  $3 - 2\sqrt{11}$ ,  $3 + 2\sqrt{11}$

53.  $-0.9 - \sqrt{2.31}$ ,  $-0.9 + \sqrt{2.31}$  55.  $3 + \sqrt{2}$ ,  $3 - \sqrt{2}$

57.  $-7 - i$ ,  $-7 + i$  59.  $\frac{5 - 2\sqrt{3}}{2}$ ,  $\frac{5 + 2\sqrt{3}}{2}$  61.  $\frac{-1 - i}{2}$ ,  $\frac{-1 + i}{2}$

63. -6, 2 65.  $-\frac{\sqrt{23}}{3}$ ,  $\frac{\sqrt{23}}{3}$  67.  $\frac{1 - i\sqrt{71}}{6}$ ,  $\frac{1 + i\sqrt{71}}{6}$

69.  $-1 - 4\sqrt{2}$ ,  $-1 + 4\sqrt{2}$  71.  $11 - 13i$ ,  $11 + 13i$

73.  $y = (x - 3)^2 + 2$ ; (3, 2) 75.  $y = (x + 8)^2 - 50$ ; (-8, -50)

77.  $y = (x - \frac{3}{2})^2 - \frac{17}{4}$ ;  $(\frac{3}{2}, -\frac{17}{4})$  79.  $y = -(x - 10)^2 + 20$ ;

(10, 20) 81.  $y = 3(x - 2)^2 - 11$ ; (2, -11)

83.  $y = 1.4(x + 2)^2 - 2.6$ ; (-2, -2.6) 85.  $-5 + 5\sqrt{5}$ ,

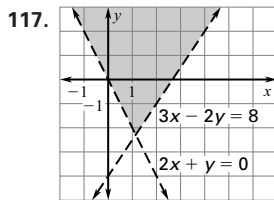
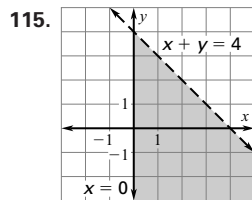
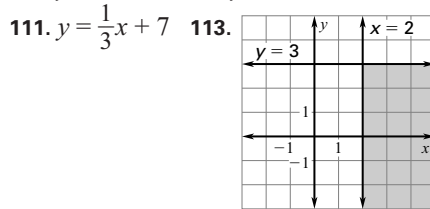
or  $\approx 6.18$  87.  $\sqrt{39} - 2$ , or  $\approx 4.24$  89.  $d = 0.08(30)^2 +$

$1.1(30) = 105$  ft; about 25.5 mi/h 91. 45.50 ft; 161.16 ft

93. about 1 cm 95. 507.5°F; 3.91 Btu/ft<sup>3</sup>

**5.5 MIXED REVIEW (p. 289)** 101. 17 103. 52 105. 0

107.  $y = 2x - 5$  109.  $y = -5x - 25$



**TECHNOLOGY ACTIVITY 5.5 (p. 290)**

1–9 odd: Estimates may vary. 1. minimum; -4.25; 2.5

3. minimum; 4; -3 5. maximum; 8.125; -0.75

7. minimum; 2.375; 3.75 9. maximum; 8.65; 2.29

**5.6 PRACTICE (pp. 295–297)**

5.  $\frac{-1 + \sqrt{5}}{2}$ ,  $\frac{-1 - \sqrt{5}}{2}$  7.  $\frac{-1 + \sqrt{2}}{3}$ ,  $\frac{-1 - \sqrt{2}}{3}$

9.  $\frac{1}{2} + 3i$ ,  $\frac{1}{2} - 3i$  11. -16; 2 imaginary 13. -47; 2 imaginary

15. 261; 2 real 17. -2, 7 19.  $1 + \sqrt{5}$ ,  $1 - \sqrt{5}$  21.  $-3 - 7i$ ,

$-3 + 7i$  23.  $\frac{-3 + \sqrt{29}}{10}$ ,  $\frac{-3 - \sqrt{29}}{10}$  25.  $\frac{-1 + i\sqrt{7}}{4}$ ,  $\frac{-1 - i\sqrt{7}}{4}$

27.  $-1, \frac{9}{7}$  29.  $\frac{-9 + \sqrt{33}}{8}$ ,  $\frac{-9 - \sqrt{33}}{8}$  31.  $-\frac{2}{5} + \frac{\sqrt{26}}{10}$ ,

$-\frac{2}{5} - \frac{\sqrt{26}}{10}$  33. -9, 11 35.  $4 + i\sqrt{19}$ ,  $4 - i\sqrt{19}$

37.  $-8 + 3\sqrt{2}$ ,  $-8 - 3\sqrt{2}$  39.  $\frac{1}{2} + \frac{\sqrt{6}}{4}$ ,  $\frac{1}{2} - \frac{\sqrt{6}}{4}$  41.  $5 + \frac{i}{2}$ ,

$5 - \frac{i}{2}$  43.  $\frac{1}{3}$ ,  $-\frac{5}{3}$  45.  $\frac{-9.5 + \sqrt{218.17}}{7.8}$ ,  $\frac{-9.5 - \sqrt{218.17}}{7.8}$

47.  $\frac{3 + \sqrt{69}}{2}$ ,  $\frac{3 - \sqrt{69}}{2}$  49. 2, 16 51.  $-4 + 3i$ ,  $-4 - 3i$

53.  $\frac{\sqrt{3}}{2}$ ,  $-\frac{\sqrt{3}}{2}$  55.  $-\frac{3}{2}, \frac{1}{7}$  57. 33; 2 real 59. 160; 2 real

61. -7; 2 imaginary 63. -19; 2 imaginary 65. zero

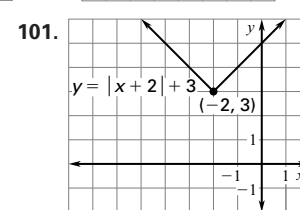
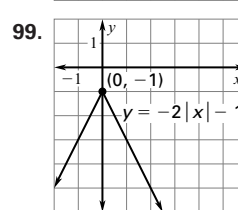
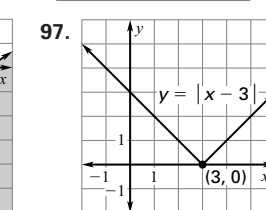
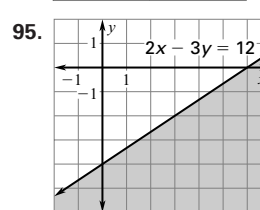
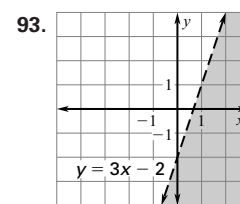
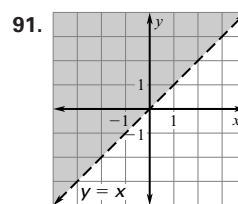
67. positive 69.  $c < 4$ ;  $c = 4$ ;  $c > 4$  71.  $c < 16$ ;  $c = 16$ ;

$c > 16$  73.  $c < 36$ ;  $c = 36$ ;  $c > 36$  75. about 2.56 sec

77. about 0.17 sec 79. 1993

**5.6 MIXED REVIEW (p. 298)**

85.  $x > 2$  87.  $x \geq -13$  89.  $3 \leq x \leq 8$



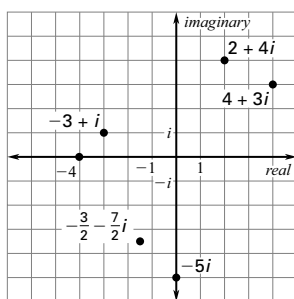
**QUIZ 2 (p. 298)** 1.  $5 + 16i$  2.  $-4 + 10i$  3.  $31 + 22i$

4.  $\frac{1}{13} - \frac{8}{13}i$  5.  $-10$

5.  $2\sqrt{5}$  6. 5

7.  $\sqrt{10}$  8. 5

9. 4 10.  $\frac{\sqrt{58}}{2}$

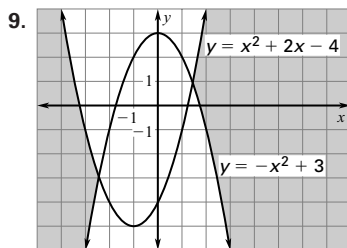
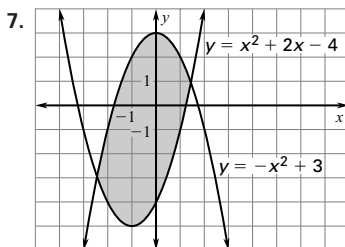
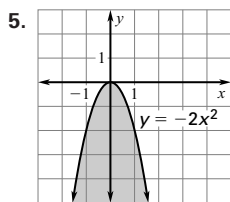


11.  $-4 + \sqrt{2}$ ,  $-4 - \sqrt{2}$  12.  $1 + 4i$ ,  $1 - 4i$  13.  $5 + 3\sqrt{3}$ ,  $5 - 3\sqrt{3}$  14.  $-2 + \frac{\sqrt{5}}{5}$ ,  $-2 - \frac{\sqrt{5}}{5}$  15.  $y = (x + 3)^2 - 8$

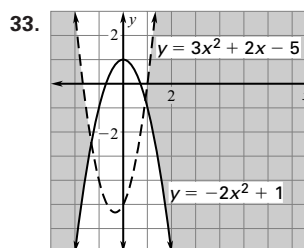
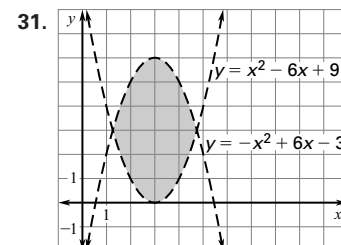
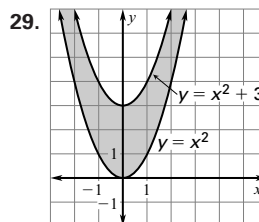
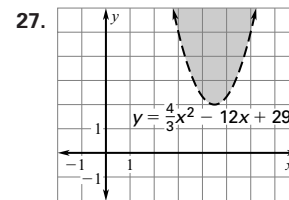
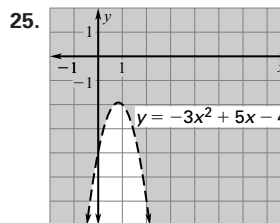
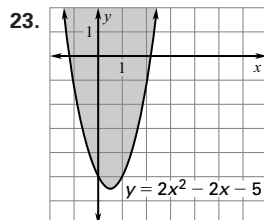
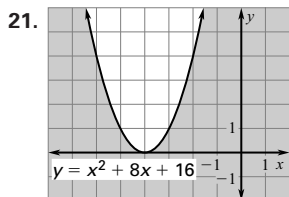
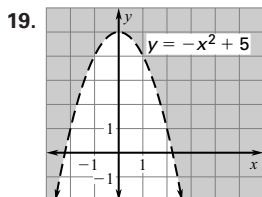
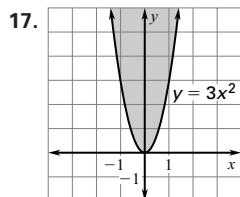
16.  $y = (x - 9)^2 - 31$  17.  $y = -2(x - 2)^2 + 1$  18.  $-1 + \sqrt{11}$ ,  $-1 - \sqrt{11}$  19.  $8 + 3i$ ,  $8 - 3i$  20.  $\frac{3 + i\sqrt{7}}{2}$ ,  $\frac{3 - i\sqrt{7}}{2}$

21.  $\frac{-4 + 2\sqrt{6}}{5}$ ,  $\frac{-4 - 2\sqrt{6}}{5}$  22. about 1 sec

**5.7 PRACTICE (pp. 303–305)**

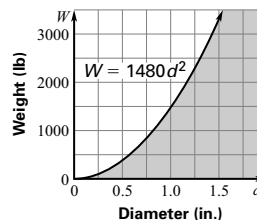


11.  $x \leq -2$  or  $x \geq 2$   
13. about 55.1 m and 447.3 m 15. C

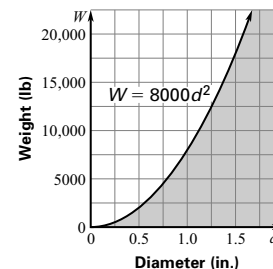


35.  $-2 < x < 1$   
37.  $x \leq -4$  or  $x \geq 2$   
39.  $x \leq -5.5$  or  $x \geq -2.5$   
41.  $x \leq -6$  or  $x \geq 3$   
43.  $-\frac{5}{2} < x < \frac{5}{2}$   
45.  $x < -0.9$  or  $x > 2.9$

**47. Weight for Manila Rope**

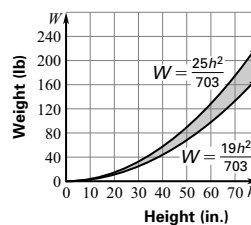


**Weight for Wire Rope**



**49. Healthy Weights**

;  $121 \leq W \leq 160$



51. about 39 to 61 years old

**5.7 MIXED REVIEW (p. 305)** 55.  $y = 4x - 5$  57.  $y = -\frac{11}{4} - \frac{1}{2}x$

59.  $y = -9x$  61.  $(2, 3, -4)$  63.  $-6$  65.  $6 - 5i$  67.  $29 - 29i$

69.  $\frac{6}{17} - \frac{7}{17}i$

**5.8 PRACTICE (pp. 309–311)** 3.  $y = -1(x - 1)^2 + 3$

5.  $y = x^2 + 3x - 2$  7.  $y = (x - 2)^2 - 2$  9.  $y = -\frac{3}{4}(x - 1)^2$

11.  $y = \frac{1}{3}(x + 4)^2 + 6$  13.  $y = -3x^2$  15.  $y = -\frac{3}{2}(x + 6)^2 - 7$

17.  $y = 3(x + 2)(x - 1)$  19.  $y = -1(x - 1)(x - 4)$

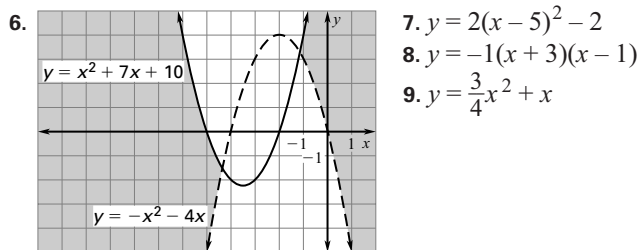
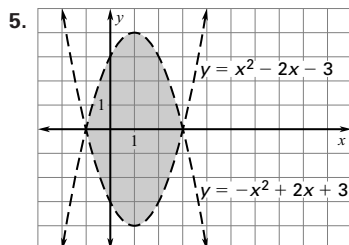
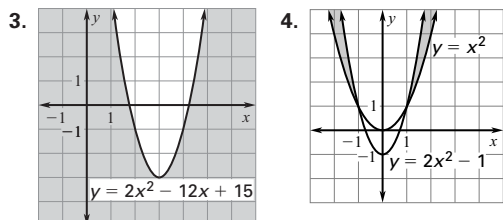
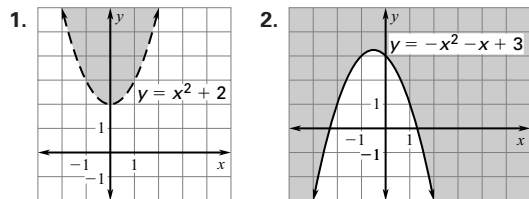
21.  $y = 2(x + 1)(x - 6)$  23.  $y = \frac{7}{5}(x - 3)(x - 9)$

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)**

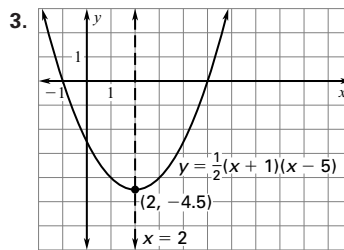
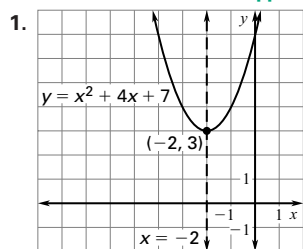
41. 5 43. -182 45. (3, -1) 47. (-4, 5)

**QUIZ 3 (p. 312)**



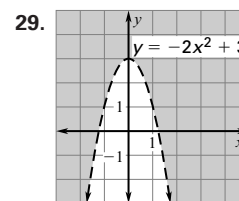
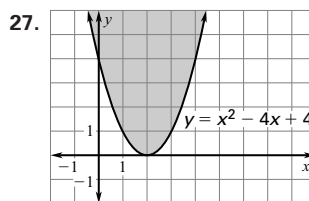
10.  $0.00339N^2 + 0.00143N - 5.95 < 1000; 0 < N < 544$

**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.  $-\frac{7}{18} - \frac{\sqrt{85}}{18}, -\frac{7}{18} + \frac{\sqrt{85}}{18}$



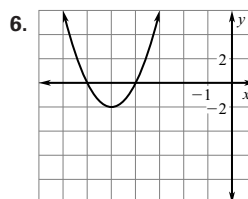
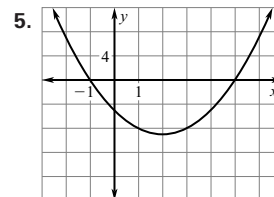
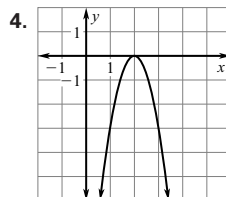
31.  $x \leq \frac{-7 - \sqrt{33}}{4}$  or  $x \geq \frac{-7 + \sqrt{33}}{4}$  33.  $y = (x-6)^2 + 1$

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

**CHAPTER 6**

**SKILL REVIEW (p. 322)**

1.  $3x^2 - x$  2.  $-3x + 10$   
 3.  $-5x^4 - 4x^3 + 7x^2$



7.  $y = x^2 - 2x - 6$   
 8.  $y = 2x^2 + 16x + 32$   
 9.  $y = -x^2 - 6x + 16$   
 10. -9, 3 11. -10 12.  $-4, \frac{3}{2}$

**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.  $V = \frac{4}{81}\pi x^3$