

## Answers for 4.8

For use with pages 296–299

### 4.8 Skill Practice

- discriminant
- Sample answer:* A volleyball player jumps to hit a ball 7 feet above the ground. The ball leaves the player's hand at a rate of 45 miles per hour. How long is the ball in the air?
- $-1, 5$
- $3 \pm \sqrt{2}$
- $-4 \pm i\sqrt{3}$
- $8 \pm \sqrt{57}$
- $\frac{1}{2}$
- $\frac{5 \pm i\sqrt{95}}{5}$
- $\frac{2 \pm \sqrt{3}}{2}$
- $\frac{-2 \pm i\sqrt{62}}{6}$
- $\frac{4 \pm \sqrt{43}}{3}$
- A
- 2
- $-3 \pm i\sqrt{6}$
- $\frac{-3 \pm i\sqrt{47}}{2}$
- $-\frac{3 \pm \sqrt{39}}{3}$
- $-\frac{5 \pm 2\sqrt{10}}{5}$
- $-\frac{-5 \pm \sqrt{85}}{12}$
- $\frac{-7 \pm \sqrt{13}}{6}$
- $-3, -\frac{3}{2}$
- $\frac{5 \pm \sqrt{31}}{3}$
- $-7, -8$
- 2, 3
- $-11, 9$
- $-1, 3$
- 1, 8
- $-2, 4$
- $-1\frac{1}{3}, \frac{1}{15}$
- $-5, -3$
- $-2, 9$
- 0; one real solution
- 5; two real solutions
- $-32$ ; two imaginary solutions
- $-223$ ; two imaginary solutions
- $-20$ ; two imaginary solutions
- 173; two real solutions
- $-335$ ; two imaginary solutions
- 25; two real solutions
- $-36$ ; two imaginary solutions
- $\frac{3}{4}$
- $\frac{1 \pm i\sqrt{67}}{2}$
- $\frac{7 \pm \sqrt{41}}{4}$
- $-2\frac{1}{2}, \frac{5}{14}$
- $\frac{9 \pm i\sqrt{15}}{4}$
- $\frac{1 \pm \sqrt{229}}{12}$
- $-0.43, 1.78$
- $0.875 \pm 0.752i$
- 1.5, 4.98
- $\sqrt{-144} = 12i$ ;  
$$x = \frac{-6 \pm \sqrt{-144}}{6}$$
$$= \frac{-6 \pm 12i}{6} = -1 \pm 2i$$

## Answers for 4.8 *continued*

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- 50.** The equation must first be rewritten in the form  $ax^2 + bx + c = 0$ .

$$x^2 + 6x + 6 = 0$$

$$x = \frac{-6 \pm \sqrt{6^2 - 4(1)(6)}}{2(1)}$$

$$= \frac{-6 \pm \sqrt{12}}{2}$$

$$= \frac{-6 \pm 2\sqrt{3}}{2}$$

$$= -3 \pm \sqrt{3}$$

$$\mathbf{51.} \quad \frac{\frac{-b + \sqrt{b^2 - 4ac}}{2a} + \frac{-b - \sqrt{b^2 - 4ac}}{2a}}{2}$$

$$= \frac{\frac{-2b}{2a}}{2} = \frac{-b}{2a},$$

which is the formula for the axis of symmetry.

- |                         |                        |
|-------------------------|------------------------|
| <b>52.</b> positive     | <b>53.</b> negative    |
| <b>54.</b> zero         | <b>55.</b> C           |
| <b>56. a.</b> $c < 4$   | <b>57 a.</b> $c < 16$  |
| <b>b.</b> $c = 4$       | <b>b.</b> $c = 16$     |
| <b>c.</b> $c > 4$       | <b>c.</b> $c > 16$     |
| <b>58. a.</b> $c > -64$ | <b>59. a.</b> $c < 48$ |
| <b>b.</b> $c = -64$     | <b>b.</b> $c = 48$     |
| <b>c.</b> $c < -64$     | <b>c.</b> $c > 48$     |

**60. a.**  $c > -6.25$

**b.**  $c = -6.25$

**c.**  $c < -6.25$

**61. a.**  $c < 0.25$

**b.**  $c = 0.25$

**c.**  $c > 0.25$

**62. Sample answer:**

$$0.5x^2 + 2x + 7 = 0$$

**63.**  $-\frac{1}{3}x^2 - \frac{1}{3}x + 4 = 0$

**64.**  $3x^2 + 7x + 4 = 0$

**65.**  $2x^2 + 4x + 4 = 0$

**66. Sample answer:** If  $3i$  is a solution then  $-3i$  must also be a solution and if  $-2i$  is a solution then  $2i$  is also a solution. A quadratic equation can only have two solutions, not four.

**67.**  $a\left(x^2 + \frac{b}{a}x\right) = -c$

$$a\left(x^2 + \frac{b}{a}x + \frac{b^2}{4a^2}\right) = -c + \frac{b^2}{4a}$$

$$a\left(x + \frac{b}{2a}\right)^2 = \frac{b^2 - 4ac}{4a}$$

$$\left(x + \frac{b}{2a}\right)^2 = \frac{b^2 - 4ac}{4a^2}$$

$$x + \frac{b}{2a} = \frac{\pm\sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

# Answers for 4.8 continued

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## 4.8 Problem Solving

68. about 0.13 sec

69. C

70. a. 20 ft                      b. 160 ft  
c. 80 ft                        d. 30 ft

71.  $1149 < E < 2081$

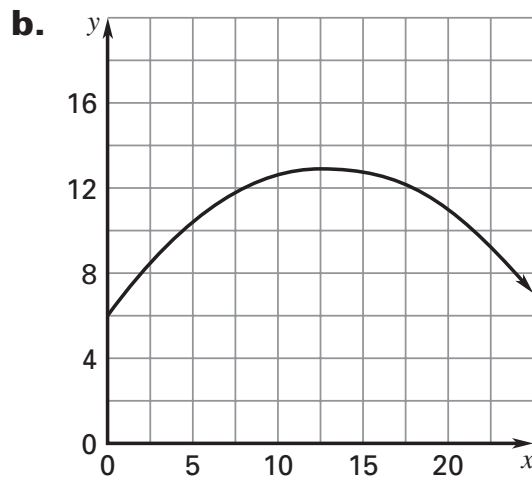
72. a.  $4\ell + 3w = 900$ ,  
 $3w = 900 - 4\ell$ ,  
 $w = 300 - \frac{4}{3}\ell$

b. 69.37 ft by 172.97 ft or  
230.63 ft by 52.03 ft

73. a.

$t$	0	0.25	0.5
$(x, y)$	(0, 6)	(5, 10.25)	(10, 12.5)

$t$	0.75	1
$(x, y)$	(15, 12.75)	(20, 11)



c. No; the height of the ball when  $x = 15$  is 12.75 feet, which is above the backboard, so the free throw would not be made.

74. a. about 101.2 ft/sec

b. According to the model, it would take about 3.2 seconds to travel up the ride. The model's accuracy is slightly off what the brochure states.

## 4.8 Mixed Review

75. 8; rises

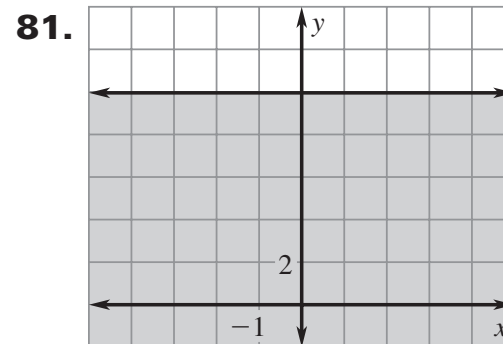
76.  $-\frac{2}{3}$ ; falls

77. 0; is horizontal

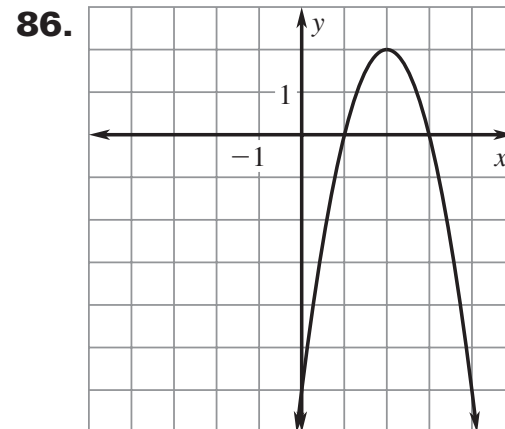
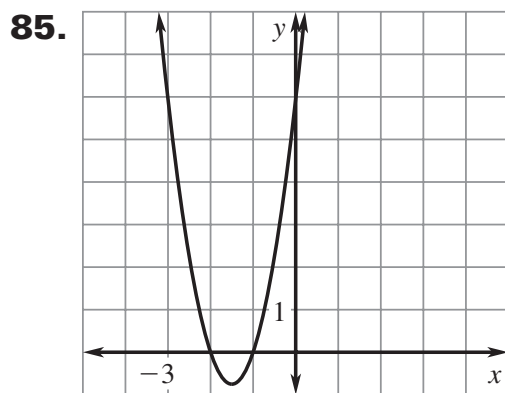
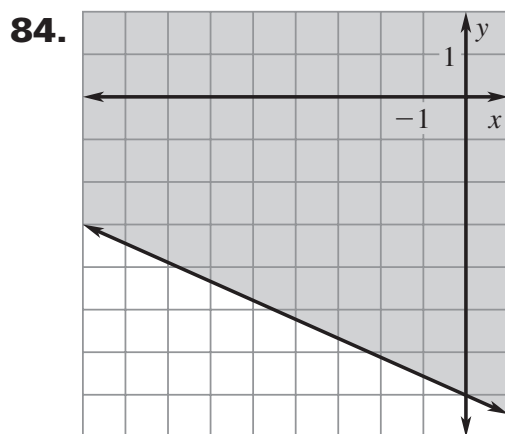
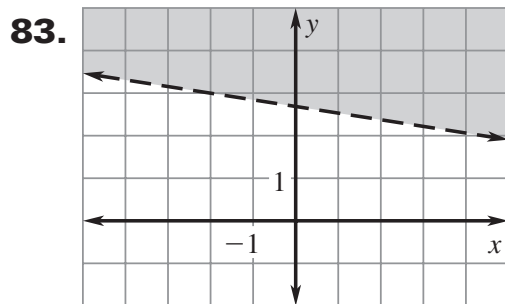
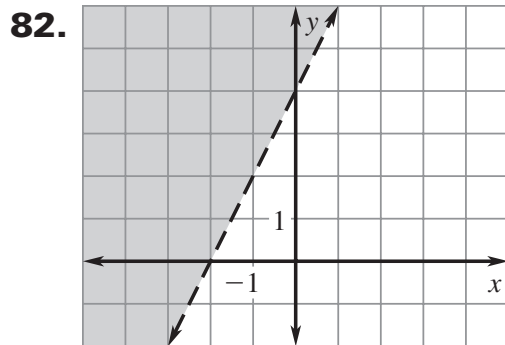
78. 3; rises

79. undefined; is vertical

80.  $-\frac{5}{11}$ ; falls



**Answers for 4.8** *continued*  
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**87.** 2000 ft; 8 min