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LESSON 22-1

Solving Equations by Taking Square Roots

Practice and Problem Solving: A/B

Solve. If the equation has no solution, give that as your answer.

1. $x^2 - 25 = 0$

2. $x^2 + 25 = 0$

3. $6x^2 - 6 = 0$

4. $-3x^2 + 27 = 0$

5. $-2x^2 - 1 = 0$

6. $4x^2 - 100 = -100$

7. $x^2 - 121 = 0$

8. $x^2 - 49 = 0$

9. $x^2 - 16 = 20$

10. $(x + 5)^2 - 6 = 43$

11. $(x - 1)^2 - 19 = 81$

12. $(x - 14)^2 + 13 = 14$

13. $2(x - 3)^2 + 1 = 73$

14. $(x - 1)^2 + 15 = 14$

15. $-2(x + 1)^2 - 5 = -55$

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Solve. Express square roots in simplest form.

16. $3x^2 - 10 = 20$

17. $x^2 - 14 = 40$

18. $2x^2 = 100$

19. $2(x+1)^2 - 1 = 9$

20. $2(x-3)^2 + 7 = 19$

21. $5(x-7)^2 + 10 = 25$

Solve.

22. A ball is dropped from a height of 64 feet. Its height, in feet, can be modeled by the function $h(t) = -16t^2 + 64$, where t is the time in seconds since the ball was dropped. After how many seconds will the ball hit the ground?

LESSON 22-3

Using the Quadratic Formula to Solve Equations

Practice and Problem Solving: A/B

Solve using the quadratic formula.

1. $x^2 + x = 12$

2. $4x^2 - 17x - 15 = 0$

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3. $2x^2 - 5x = 3$

4. $3x^2 + 11x + 5 = 0$

5. $x^2 - 11x + 28 = 0$

6. $x^2 - 49 = 0$

7. $6x^2 + x - 1 = 0$

8. $x^2 + 8x - 20 = 0$

Find the number of real solutions of each equation using the discriminant.

9. $x^2 + 25 = 0$

10. $x^2 + 5x + 4 = 0$

11. $x^2 + 8x + 16 = 0$

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Solve.

12. A model rocket is launched from a platform 12 meters high at a speed of 35 meters per second. Its height h can be modeled by the equation $h = -4.9t^2 + 35t + 12$, where t is the time in seconds. At what time will the rocket be at an altitude of 60 meters?

LESSON 22-1

Practice and Problem Solving: A/B

1. $x = -5$ or $x = 5$
2. no solution
3. $x = -1$ or $x = 1$
4. $x = -3$ or $x = 3$
5. no solution
6. $x = 0$
7. $x = 11$ or $x = -11$
8. $x = 7$ or $x = -7$
9. $x = 6$ or $x = -6$
10. $x = -12$ or $x = 2$
11. $x = 11$ or $x = -9$
12. $x = 15$ or $x = 13$
13. $x = -3$ or $x = 9$
14. no solution
15. $x = -6$ or $x = 4$
16. $x = \pm\sqrt{10}$
17. $x = \pm 3\sqrt{6}$
18. $x = \pm 5\sqrt{2}$
19. $x = -1 \pm \sqrt{5}$
20. $x = 3 \pm \sqrt{6}$
21. $x = 7 \pm \sqrt{3}$

20. 2 s

LESSON 22-3

Practice and Problem Solving: A/B

1. 3 and -4
2. 5 and $-\frac{3}{4}$
3. 3 and $-\frac{1}{2}$
4. $\frac{-11+\sqrt{61}}{6}$ and $\frac{-11-\sqrt{61}}{6}$
5. 7 and 4
6. 7 and -7
7. $\frac{1}{3}$ and $-\frac{1}{2}$
8. 2 and -10
9. -100, no real solution
10. 9, two real solutions
11. 0, one real solution
12. $t = \frac{-35 \pm \sqrt{284.2}}{-9.8}$

    $t \approx 5.29$ or 1.85

    The rocket will be at an altitude of 60 meters at about 5.29 seconds and 1.85 seconds.