UNIT 3 • MODELING AND ANALYZING QUADRATIC FUNCTIONS

Lesson 1: Creating and Solving Quadratic Equations in One Variable

Practice 3.1.7: Applying the Quadratic Formula   A

For problems 1 and 2, find the discriminant. Determine the number and type of roots of the equation.

1. $4x^2 + 4x + 1 = 0$

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

For problems 3–6, solve using the quadratic formula.

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

4. $16 - 8x - x^2 = 0$

5. $3x^2 + 7x + 12 = 0$

6. $-32x = 2x^2 - x - 51$

For problems 7–10, read each scenario and use the quadratic formula to answer the questions.

7. The height of a softball in meters x seconds after it has been thrown upward is given by $-4.9x^2 + 9x + 1.2$. After how many seconds does the ball hit the ground?

8. A company sells about $20x - x^2$ units each month, where x is the price of one unit. For what price(s) does the company sell 100 units?

9. As part of a science experiment, Carson designs and creates a cushioned egg carrier. He puts an egg inside it, and then drops it from a window to see whether his design can safely cushion the egg and keep it from breaking. The egg's height in feet x seconds after being dropped is given by $27 - 16x^2$. After how many seconds will the egg hit the ground?

10. How does the quadratic formula show the number and type of solutions of a quadratic equation?