

## 6.2 Switching Forms and Quadratic Applications

**Write each equation in intercept form.**

1)  $y = x^2 + 6x + 5$

2)  $y = -2x^2 + 16x - 30$

3)  $y = -(x - 2)^2 + 4$

4)  $y = (x + 4)^2 - 4$

**Write each equation in standard form.**

5)  $y = -2(x + 7)(x - 1)$

6)  $y = 3(x + 2)(x - 4)$

7)  $y = (x + 2)^2 - 1$

8)  $y = 2(x + 1)^2 + 1$

**Write each equation in vertex form.**

9)  $y = x^2 + 4x + 2$

10)  $y = -2x^2 - 16x - 36$

11)  $y = (x - 1)(x + 5)$

12)  $y = -(x - 2)(x - 8)$

**Answer each question.**

13) A rocket is launched from atop a 192 foot cliff with an initial velocity of 64 ft/s represented by the equation  $h = -16t^2 + 64t + 192$ .

- a. What is the maximum height of the rocket?
- b. How long will it take the rocket to reach its maximum height?
- c. How high is the rocket after 2.5 seconds?
- d. How long will it take the rocket to hit the ground after it is launched?

14) You are trying to dunk a basketball. You need to jump 2.5 feet in the air to dunk the ball. The height that your feet are above the ground is given by the function  $h = -16t^2 + 12t$ .

- a. What is the maximum height your feet will be above the ground?
- b. Will you be able to dunk the basketball? Explain.

- 15) A diver is standing on a platform 24 feet above the pool. He jumps from the platform with an initial upward velocity of 8 ft/s. Use the formula  $h = -16t^2 + 8t + 24$ , where  $h$  is his height above the water, and  $t$  is the time.
- What is the maximum height of the diver?
  - How long did it take the diver to reach the maximum height?
  - How long will it take for him to hit the water?
- 16) One of the games at a carnival involves trying to ring a bell with a ball by hitting a lever that propels the ball into the air. The height of the ball is modeled by equation  $h = -16t^2 + 38t$ .
- What is the maximum height the ball will reach?
  - If the bell is 25 feet above the ground, will it be hit by the ball?

**Use the graph in the problem to answer each question.**

- 17) Jason jumped off of a cliff into the ocean in Acapulco while vacationing with some friends. His height as a function of time could be modeled by the function below, where  $x$  is the time in seconds and  $h$  is the height in feet.
- Estimate how long it took Jason to reach his maximum height?
  - What was the highest point that Jason reached?
  - Jason hit the water after how many seconds?
  - About what was Jason's height after 2.5 seconds?

