

## Part 1

### 9-1 Identifying Quadratic Functions

Tell whether each function is quadratic. Explain.

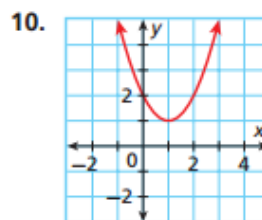
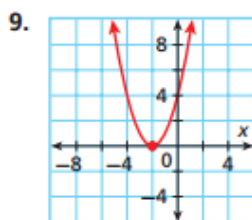
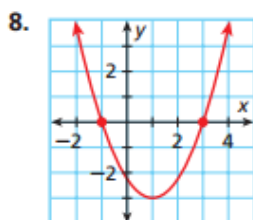
1.  $y + 2x^2 = 3x$       2.  $x^2 + y = 4 + x^2$       3.  $(-2, 12)(-1, 3)(0, 0)(1, 3)$

Tell whether the graph of each quadratic function opens upward or downward and whether the parabola has a maximum or a minimum.

4.  $y = -x^2 - 7x + 18$       5.  $y - 2x^2 = 4x + 3$       6.  $f(x) = 5x - 0.5x^2$
7. Graph the function  $y = \frac{1}{2}x^2 - 2$  and give the domain and range.

### 9-2 Characteristics of Quadratic Functions

Find the zeros of each function from its graph. Then find its the axis of symmetry.



Find the vertex of each parabola.

11.  $y = x^2 + 6x + 2$       12.  $y = 3 + 4x - 2x^2$       13.  $y = 3x^2 + 12x - 12$
14. The height in feet of the curved roof of an aircraft hangar can be modeled by  $y = -0.02x^2 + 1.6x$ , where  $x$  is the distance in feet from one wall at ground level. How tall is the hangar?

## Part 2

### 9-5 Solving Quadratic Equations by Graphing

Solve each equation by graphing the related function.

1.  $x^2 - 9 = 0$       2.  $x^2 + 3x - 4 = 0$       3.  $4x^2 + 8x = 32$
4. The height of a fireworks rocket launched from a platform 35 feet above the ground can be approximated by  $h = -5t^2 + 30t + 35$ , where  $h$  is the height in meters and  $t$  is the time in seconds. Find the time it takes the rocket to reach the ground after it is launched.

### 9-6 Solving Quadratic Equations by Factoring

Use the Zero Product Property to solve each equation.

5.  $(x + 1)(x + 3) = 0$       6.  $(x - 6)(x - 3) = 0$       7.  $x(x + 3) = 18$       8.  $(x + 2)(x - 5) = 60$

Solve each quadratic equation by factoring.

9.  $x^2 - 4x - 32 = 0$       10.  $x^2 - 8x + 15 = 0$       11.  $x^2 + x = 6$       12.  $-8x - 33 = -x^2$
13. The height of a soccer ball kicked from the ground can be approximated by the function  $h = -16t^2 + 64t$ , where  $h$  is the height in feet and  $t$  is the time in seconds. Find the time it takes for the ball to return to the ground.