

**MODULE 2.2 - QUADRATIC FUNCTIONS**

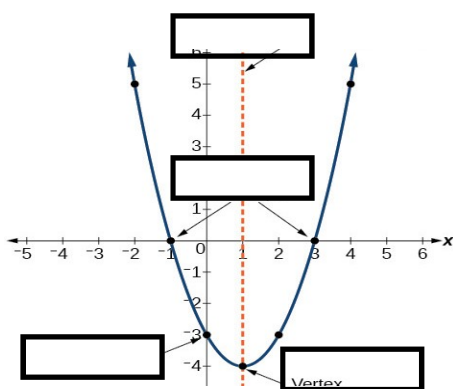
**LEARNING OBJECTIVES**

In this section, you will:

- Recognize characteristic of parabolas.
- Understand how the graph of a parabola is related to its quadratic function.
- Determine a quadratic function’s minimum or maximum value.
- Solve problems involving a quadratic function’s minimum or maximum value.

**RECOGNIZING CHARACTERISTICS OF PARABOLAS**

- Correctly label each characteristic of the parabola below.



**UNDERSTANDING HOW THE GRAPHS OF PARABOLAS ARE RELATED TO THEIR QUADRATIC FUNCTIONS**

- State the definition of the forms of quadratic functions

*How To...* Given a graph of a quadratic function, write the equation of the function in general form.



**DETERMINING THE MAXIMUM AND MINIMUM VALUES OF QUADRATIC FUNCTIONS**

*How To...* Given a quadratic function ( $x$ ), find the  $y$  - and  $x$ -intercepts.



## MODULE 2.2 - CLASS NOTES

1. Rewrite the quadratic function in standard form.

$$g(x) = x^2 + 2x - 3$$

2. Determine whether there is a minimum or maximum value. Find the value and the axis of symmetry.

$$y(x) = 2x^2 + 10x + 12$$

3. Determine the domain and range of the quadratic function.

$$f(x) = -2(x + 3)^2 - 6$$

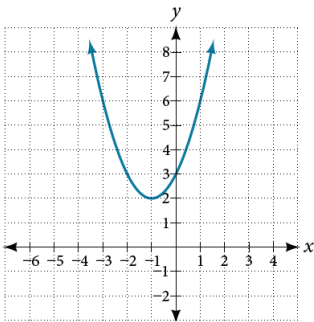
4. Determine the domain and range of the quadratic function.

$$f(x) = x^2 + 6x + 4$$

5. Use the vertex  $(h, k)$  and the point on the graph  $(x, y)$  to find the general form of the equation of the quadratic function.

$$(h, k) = (2, 0), \quad (x, y) = (4, 4)$$

6. Write the equation for the graphed function.



7. A rocket is launched in the air. Its height, in meters above sea level, as a function of time, in seconds, is given by  $h(t) = -4.9t^2 + 225t + 539$ . Find the maximum height the rocket attains.