

# Graphing Quadratics *Enrichment*

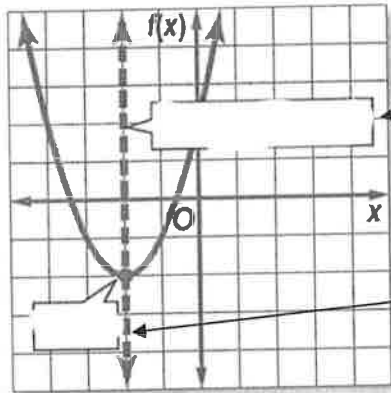
Name \_\_\_\_\_

Fill in each blank using the word bank.

vertex	minimum	axis of symmetry	x-intercepts
parabola	maximum	zeros/roots	$ax^2 + bx + c$

1. Standard form of a quadratic function is  $y =$  \_\_\_\_\_

2. The shape of a quadratic equation is called a \_\_\_\_\_



3. \_\_\_\_\_

4. \_\_\_\_\_

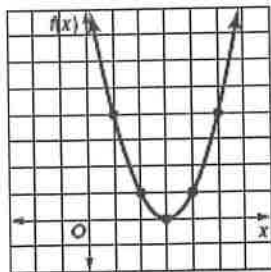
5. When the vertex is the highest point on the graph, we call that a \_\_\_\_\_.

6. When the vertex is the lowest point on the graph, we call that a \_\_\_\_\_.

7. Our solutions are the \_\_\_\_\_.

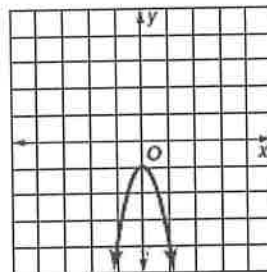
8. Solutions to quadratic equations are called \_\_\_\_\_.

Determine whether the quadratic functions have two real roots, one real root, or no real roots. If possible, list the zeros of the function.



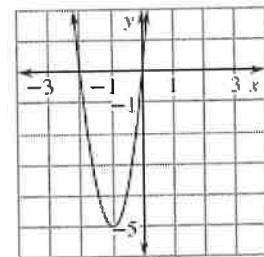
9. Number of roots: \_\_\_\_\_

Zero(s): \_\_\_\_\_



10. Number of roots: \_\_\_\_\_

Zero(s): \_\_\_\_\_



11. Number of roots: \_\_\_\_\_

Zero(s): \_\_\_\_\_

12. Given the graph, identify the following.

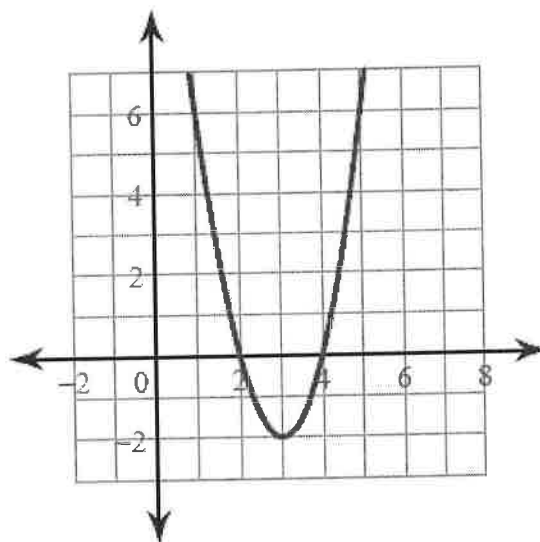
Axis of symmetry: \_\_\_\_\_

Vertex: \_\_\_\_\_

How many zeros: \_\_\_\_\_ which are: \_\_\_\_\_

Domain: \_\_\_\_\_

Range: \_\_\_\_\_



Graph the following quadratic functions by using critical values and/or factoring.

You need three points to graph and don't necessarily need all the information listed.

**Remember:** Option 1: If it factors, find the zeros.

The middle of the two factors is the axis of symmetry.

Option 2: If it doesn't factor, find the axis of symmetry with  $x = \frac{-b}{2a}$

Plug the  $x$ -value into the original equation to find the  $y$ -value of the vertex. The  $y$ -intercept is at  $(0, c)$

13.  $y = x^2 - 2x - 3$  factor or critical values?

Identify the zeros/roots: \_\_\_\_\_ and \_\_\_\_\_

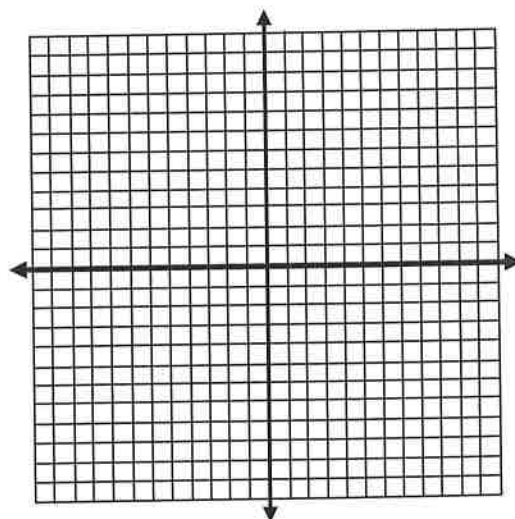
Does it have a minimum or maximum? \_\_\_\_\_

Axis of symmetry: \_\_\_\_\_ Vertex: \_\_\_\_\_

$y$ -intercept: \_\_\_\_\_

Domain: \_\_\_\_\_ Range: \_\_\_\_\_

Graph at least 5 points



14.  $y = -x^2 - 4x + 5$  factor or critical values?

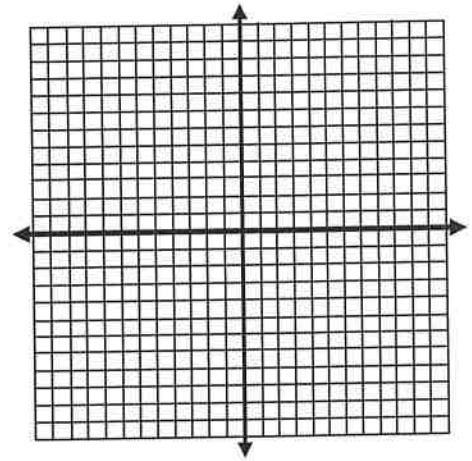
Identify the zeros/roots: \_\_\_\_\_ and \_\_\_\_\_

Does it have a minimum or maximum? \_\_\_\_\_

Axis of symmetry: \_\_\_\_\_ Vertex: \_\_\_\_\_

y-intercept: \_\_\_\_\_ Graph at least 5 points

Domain: \_\_\_\_\_ Range: \_\_\_\_\_

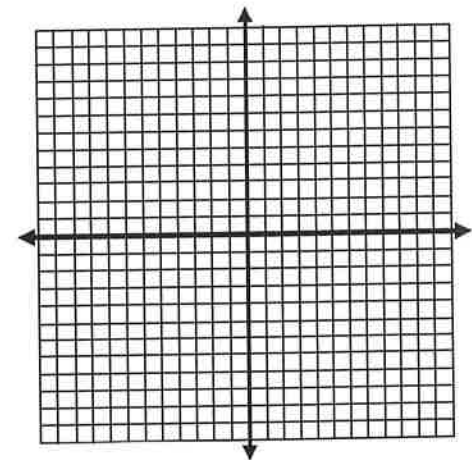


15.  $y = x^2 + 4x + 7$  factor or critical values?

Axis of symmetry: \_\_\_\_\_ Vertex: \_\_\_\_\_

Max or Min? \_\_\_\_\_

y-intercept: \_\_\_\_\_ Graph at least 3 points

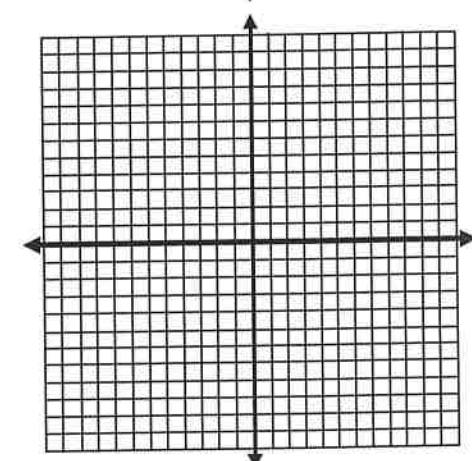


16.  $y = -x^2 - 2x + 2$  factor or critical values?

Axis of symmetry: \_\_\_\_\_ Vertex: \_\_\_\_\_

Max or Min? \_\_\_\_\_

y-intercept: \_\_\_\_\_ Graph at least 5 points



17. A bottlenose dolphin jumps out of the water. The path the dolphin travels can be modeled by  $h = -0.2d^2 + 2d$ , where  $h$  represents the height of the dolphin and  $d$  represents horizontal distance.

- What is the maximum height the dolphin reaches?
- How far did the dolphin jump?