

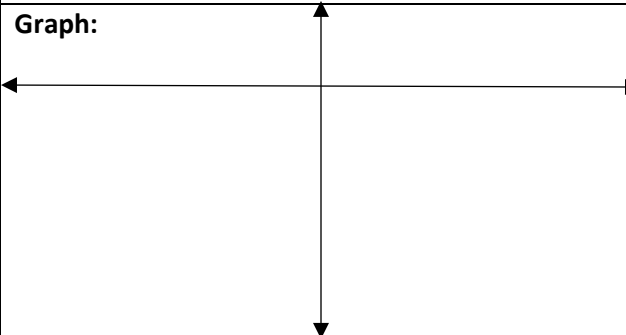
Lesson 16: Finding the Zeros of Quadratics

Objectives	Terms
<ul style="list-style-type: none"> To factor quadratics and identify zeros. To check zeros of quadratics. To graph a quadratic from different forms. To identify the zeros of a quadratic from a graph. 	<ul style="list-style-type: none"> Roots/zeros Vertex Form Parabola x-intercepts Real Zeros Axis of Symmetry

Think about this: What are the zeros of a quadratic function?

Definitions:

- There are different formats for writing a quadratic function. Each form provides different information.

Standard Form: _____ Gives you: Example:	Factored Form: _____ Gives you: Example:
Vertex Form: _____ Gives you: This is where: Example:	Graph: 

- Axis of Symmetry:**
 - Is a _____ line, with the equation of:
 - It is the _____ of the vertex.
 - It cuts the graph of a quadratic into _____ halves.
- Zeros:** The zero of a quadratic is when the equation is _____ and you solve for _____.
 - Zeros are also known as _____.
 - Can find the zeros by graphing or using the Quadratic Formula.

Quadratic Formula:
- Check:** To check if the zeros are correct, you evaluate the quadratic with the _____ found while solving when $y = 0$. If the result is _____, then the value is an x-intercept or a zero of the quadratic function.

Lesson 16: Finding the Zeros of Quadratics

- **Graph:** The graph of a quadratic is called a _____.
 - The _____ of the quadratic are where the parabola crosses the _____.
 - If the graph crosses the x-axis and represents a real solution.
 - There are:
 - **2 real zeros**
 - **1 real zero**
 - **No real zero**

Examples: Use the space provided to find the x-intercepts and the vertex of each quadratic. Sketch your graph in the space provided.

1. **2 real zeros:** $y = (x + 5)(x - 3)$

a. x-intercept(s):

b. Vertex:

Sketch your graph here.

2. **1 real zero:** $y = 3(x + 4)^2$

a. x-intercept(s):

b. Vertex:

Sketch your graph here.

3. **No real zeros:** $y = 3x^2 + 4x + 5$

a. x-intercept(s):

b. Vertex:

Sketch your graph here.

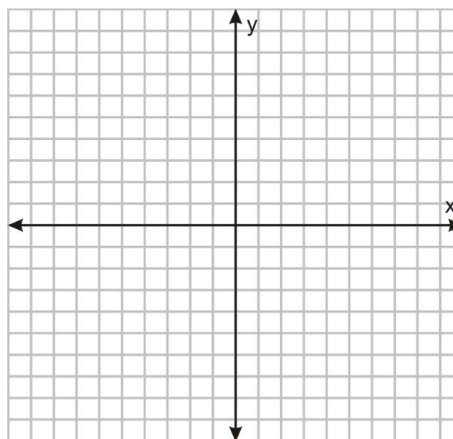
Lesson 16: Finding the Zeros of Quadratics

Example: Use your graphing calculator to graph each quadratic.

Graph each of the following quadratics.

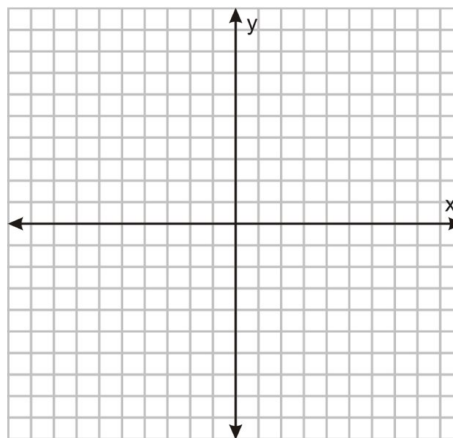
1. $y = \underline{\hspace{2cm}}$

- Sketch the graph.
- Where does the graph cross the x-axis?



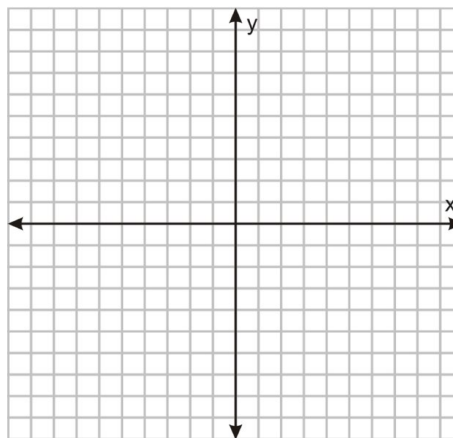
2. $y = \underline{\hspace{2cm}}$

- Sketch the graph.
- Where does the graph cross the x-axis?



3. $y = \underline{\hspace{2cm}}$

- Sketch the graph.
- Where does the graph cross the x-axis?



Lesson 16: Finding the Zeros of Quadratics

Solve by Factoring: Factor the quadratic and find the zeros.

Quadratic: $y = \underline{\hspace{2cm}}$

Mathematical Steps		Description
		Factor out any factor common to all three terms.
		Rewrite in factored form.
		Set $y = 0$ (think about why we do this)
		Set each factor with a variable equal to 0 and solve for x
		Check your answers by plugging in each x-value into the quadratic.
		State the answer as $x = \underline{\hspace{1cm}}$.

Practice: Find the zeros to each quadratic. Test your value(s).

<p>1. $y = x^2 + 2x - 15$</p> <p>Test Step:</p> <div style="border: 1px dashed black; padding: 5px; width: fit-content;">Zeros(s):</div>	<p>2. $y = 2x^2 - 7x - 4$</p> <p>Test Step:</p> <div style="border: 1px dashed black; padding: 5px; width: fit-content;">Zero(s):</div>
<p>Where will you see this in upcoming material?</p>	<p>What are the calculator skills you needed?</p>