

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Topic: \_\_\_\_\_

Class: \_\_\_\_\_

Main Ideas/Questions

Notes/Examples

### VERTEX FORM

of a Quadratic Equation

• Vertex Form of a Quadratic Equation:

• \_\_\_\_\_ is the vertex; \_\_\_\_\_ is the axis of symmetry

Directions: Give the **transformations and vertex.**

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

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- 

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

2.  $y = -(x - 3)^2$

- 
- 

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

3.  $y = (x - 5)^2 - 4$

- 
- 

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

4.  $y = -2x^2 + 3$

- 
- 

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

### Transforming from Vertex Form

Directions: Graph each equation using a table of values. Identify the **transformations.**

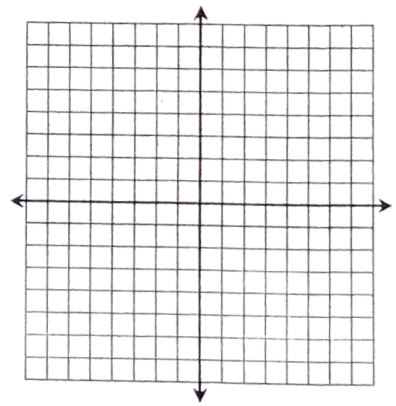
5.  $y = -(x + 2)^2 + 7$

- 
- 
- 

Axis of Symmetry: \_\_\_\_\_

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

x	y



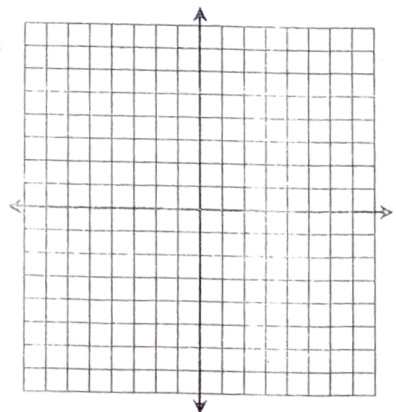
6.  $y = 3(x - 1)^2$

- 
- 

Axis of Symmetry: \_\_\_\_\_

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

x	y



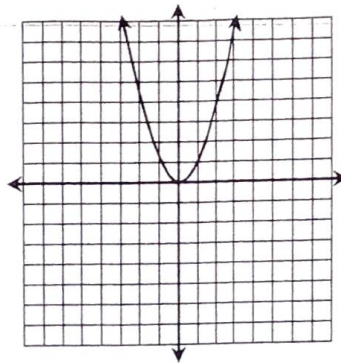
# TRANSFORMATIONS from the Parent Function

- The most simplistic quadratic equation is \_\_\_\_\_.
- This is known as the \_\_\_\_\_.
- A **transformation** is a \_\_\_\_\_ to the \_\_\_\_\_ or \_\_\_\_\_ of a figure.

**Directions:** Graph each function. Describe how it compares to the parent function shown on the graph.

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

x	y



**Transformations:**

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8. If the graph of the function  $y = x^2$  is translated so its vertex is now at the point  $(0, -3)$ , which equation represents the new function?

- A.  $y = (x - 3)^2$
- B.  $y = (x + 3)^2$
- C.  $y = x^2 - 3$
- D.  $y = x^2 + 3$

9. The graph of the function  $y = x^2$  is reflected across the  $x$ -axis, then translated two units left and six units down, write an equation to represent the new function.

Given the function, check all transformations that occurred from the graph of the function  $y = x^2$ .

$y = \frac{1}{3}(x + 7)^2 + 4$

<input type="checkbox"/> up 7 units	<input type="checkbox"/> up 4 units	<input type="checkbox"/> vertical stretch
<input type="checkbox"/> down 7 units	<input type="checkbox"/> down 4 units	<input type="checkbox"/> vertical compression
<input type="checkbox"/> left 7 units	<input type="checkbox"/> left 4 units	<input type="checkbox"/> reflection in $x$ -axis
<input type="checkbox"/> right 7 units	<input type="checkbox"/> right 4 units	<input type="checkbox"/> reflection in $y$ -axis

Describe the transformations from the parent function given each equation.

11.  $y = -x^2 + 6$

- 
-

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

- 
-

13.  $y = 2(x - 5)^2 + 4$

- 
- 
-

14. If the graph of the function  $y = x^2$  is reflected over the  $x$ -axis, then translated two units left, write an equation to represent the function.

15. If the graph of the function  $y = x^2$  is vertically compressed by a factor of  $\frac{1}{4}$ , then translated seven units right and one unit down, write an equation to represent the function.