

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

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

## Reflections

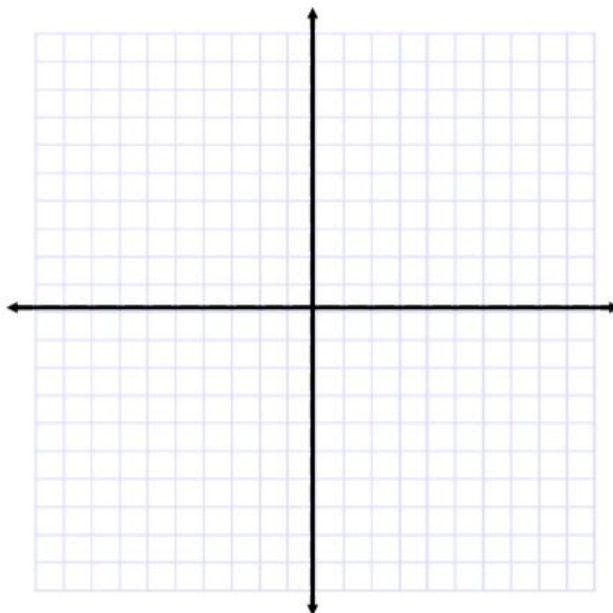
On the grid to the right, graph the following functions:

$$f(x) = x^2$$

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

$$h(x) = -x^2 + 4x + 2$$

$$j(x) = -(x+4)^2 - 2$$



Predict: What effect does a negative "a" value have on the graph of a parabola?

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\_\_\_\_\_

## Dilations

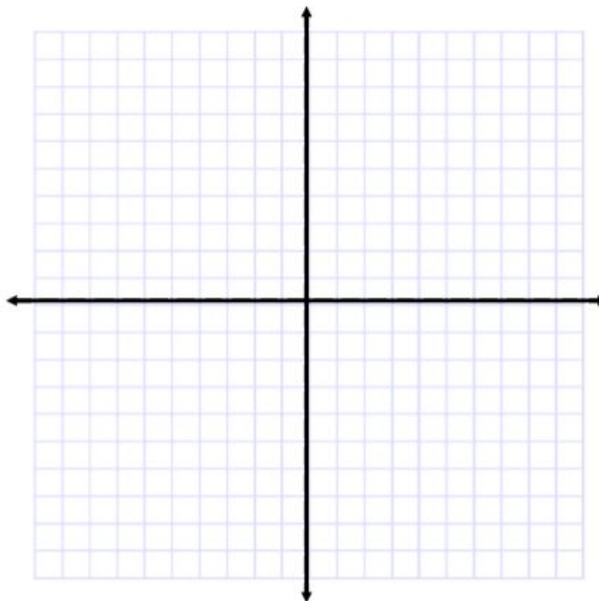
On the grid below, graph the following functions:

$$f(x) = x^2$$

$$g(x) = 2x^2$$

$$h(x) = 10x^2$$

$$j(x) = \frac{1}{4}x^2$$



Predict: What effect does the "a" value have on the graph of a parabola?

\_\_\_\_\_

\_\_\_\_\_

## General Rules:

Reflections:

If  $a > 0$ , the parabola is open \_\_\_\_\_ and the vertex is a \_\_\_\_\_

If  $a < 0$  the parabola is open \_\_\_\_\_ and the vertex is a \_\_\_\_\_

Dilations:

If  $|a| > 1$  the parabola will be \_\_\_\_\_ by being \_\_\_\_\_

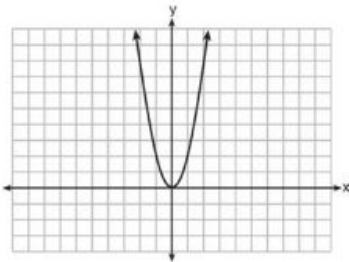
If  $|a| < 1$  the parabola will be \_\_\_\_\_ by being \_\_\_\_\_

Describe how the following functions are transformed from the parent function  $f(x) = x^2$ :

1.	2.	3.
4.	5.	6.

Regents Prep:

1. The graph of the equation  $y = ax^2$  is shown below.



Describe how the graph will change if  $a$  is multiplied by  $-\frac{1}{2}$

2. Consider the graph of the equation  $y = a^2 + bx + c$ , when  $a \neq 0$ . If  $a$  is multiplied by 3, what is true of the graph of the resulting parabola?

- 1) The vertex is 3 units above the vertex of the original parabola.
- 2) The new parabola is 3 units to the right of the original parabola.
- 3) The new parabola is wider than the original parabola.
- 4) The new parabola is narrower than the original parabola.

3. Which is the equation of a parabola that has the same vertex as the parabola represented by  $y = x^2$ , but is wider?

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

4. When the function  $f(x) = x^2$  is multiplied by the value  $a$ , where  $a > 1$ , the graph of the new function,  $g(x) = ax^2$

- 1) opens upward and is wider
- 2) opens upward and is narrower
- 3) opens downward and is wider
- 4) opens downward and is narrower