

Date: _____

Learning Goal

What's my h again?

If you were given this equation:

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

What is the value of h ?

Has the parabola been moved left or right?

What's my h again?

If you were given this equation:

$$y = (x + 3)^2$$

What is the value of h ?

Has the parabola been moved left or right?

Vertex Form Equations

Now that we know what ***a***, ***h*** and ***k*** do, we are ready to put them together and look at equations in the form.

$$y = a(x - h)^2 + k$$

This is called the **vertex form equation** of a parabola! You will see why in a moment.

Vertex Form Equations

$$y = \pm a(x - h)^2 + k$$

\pm -

a -

h -

k -

vertex: (,)

Vertex Form Equations

If we were given a vertex form equation

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

What are the coordinates of the vertex?

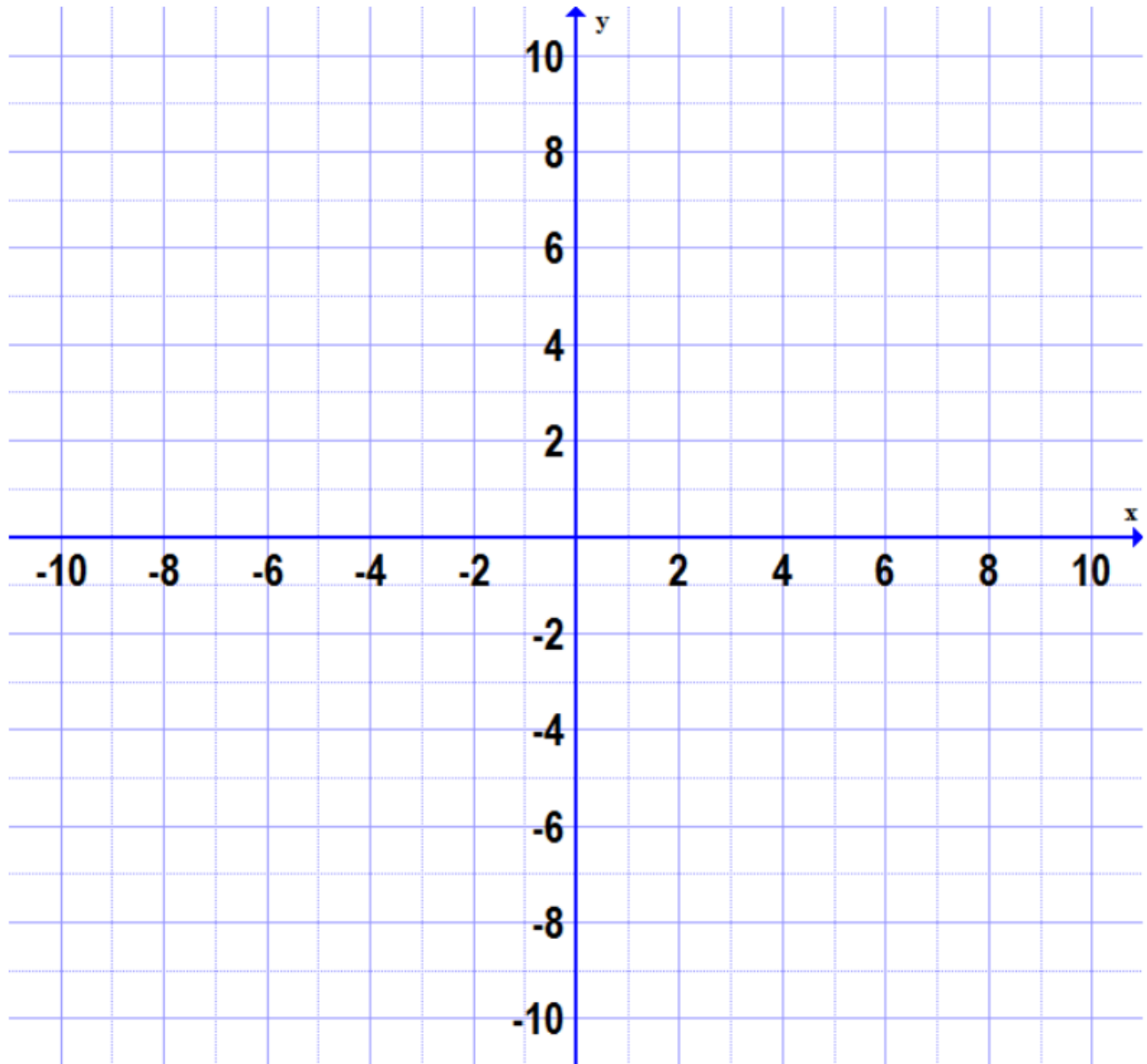
The x-coordinate is the ***h*** value!

The y-coordinate is the ***k*** value!

What is the ***new*** step pattern?

It's the old step pattern multiplied by ***a***!

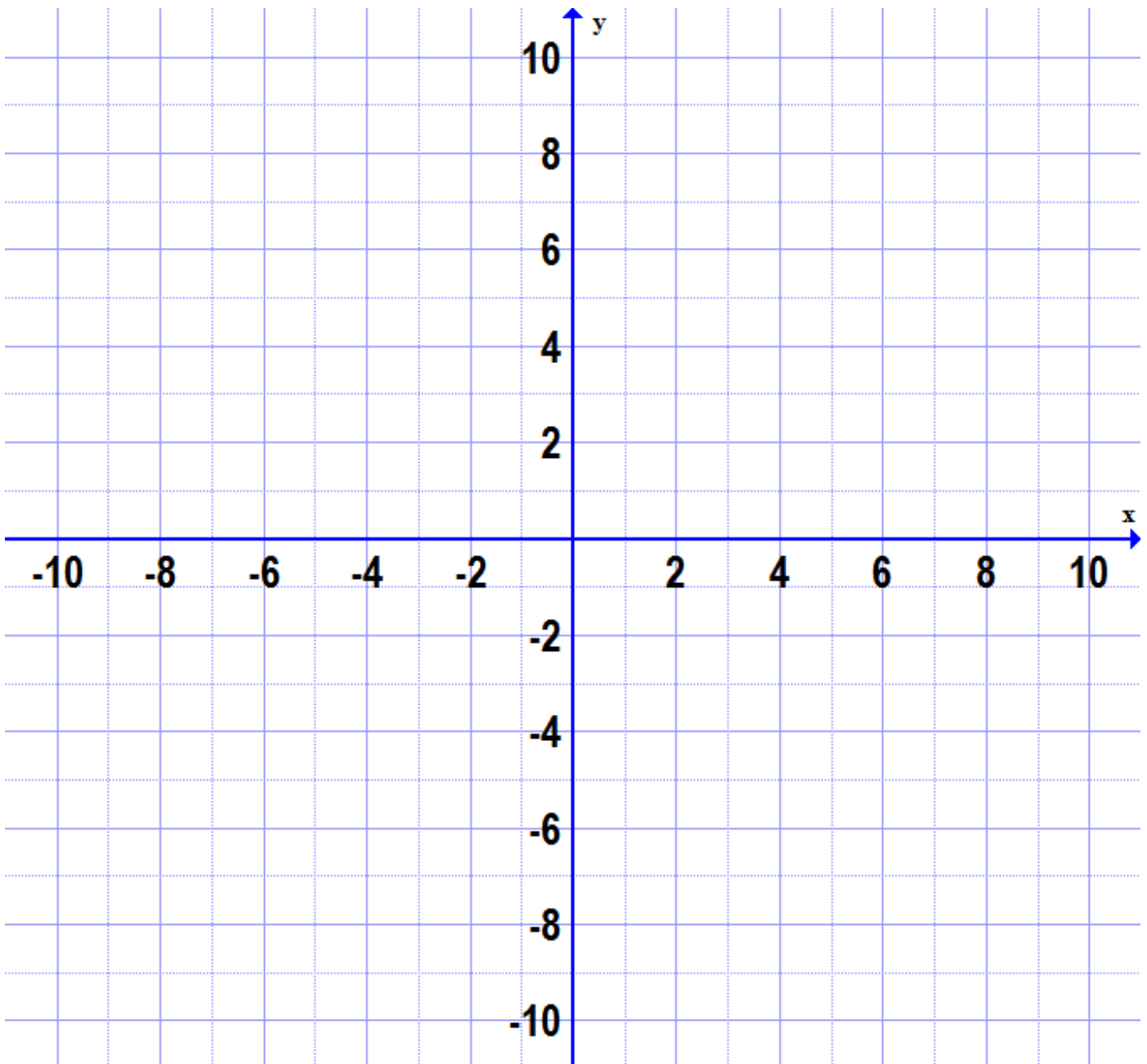
$$y = x^2 \text{ and } y = -2(x - 5)^2 + 4$$



Equation	Vertex	Step Pattern
$y = x^2$		
$y = -2(x - 5)^2 + 4$		

Graphing $y = a(x - h)^2 + k$

Equation	Vertex	Step Pattern
$y = 2(x - 3)^2 + 4$		
$y = -2(x + 1)^2 + 3$		
$y = 0.5(x + 4)^2 - 6$		



Equations, Vertices and Step Patterns

Equation	Vertex	Step Pattern
$y = 2(x - 3)^2 + 4$	(3, 4)	2, 6, 10, ...
$y = -3(x + 7)^2 + 9$		
	(10, -4)	-0.5, -1.5, -2.5, ...
$y = -2x^2 + 5$		
$y = -4(x + 3)^2$		
	(4, -7)	1, 3, 5, ...
$y = -(x - 3)^2$		
$y = -x^2 + 11$		
	(0, 3)	-1, -3, -5, ...

Graphing $y = a(x - h)^2 + k$

Equation	Vertex	Step Pattern
$y = 2x^2 - 3$		
$y = -(x + 4)^2 + 4$		
$y = -0.5(x - 5)^2$		

