

Quadratic Equations

A quadratic equation can be written in several forms. The most common / useful form is called **standard form**. A quadratic equation written in standard form looks like this:

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

As you already know, when you graph a quadratic equation, the result is a parabola. The parabola will look different, dependent on the values of a , h , and k in the equation above. Your job today is to figure out what role each of these three parameters (a , h , and k) has on the shape and size of the parabola.

Follow these steps carefully:

- 1) go to <http://www.mathopenref.com/quadvertexexplorer.html>
- 2) click on "full screen" and "vertex"
- 3) slide a to 1, h to 0, and k to 0
- 4) sketch the resulting parabola (use the coordinate plane at the bottom of this page)
- 5) move the sliders to see what happens and answer the questions on the back

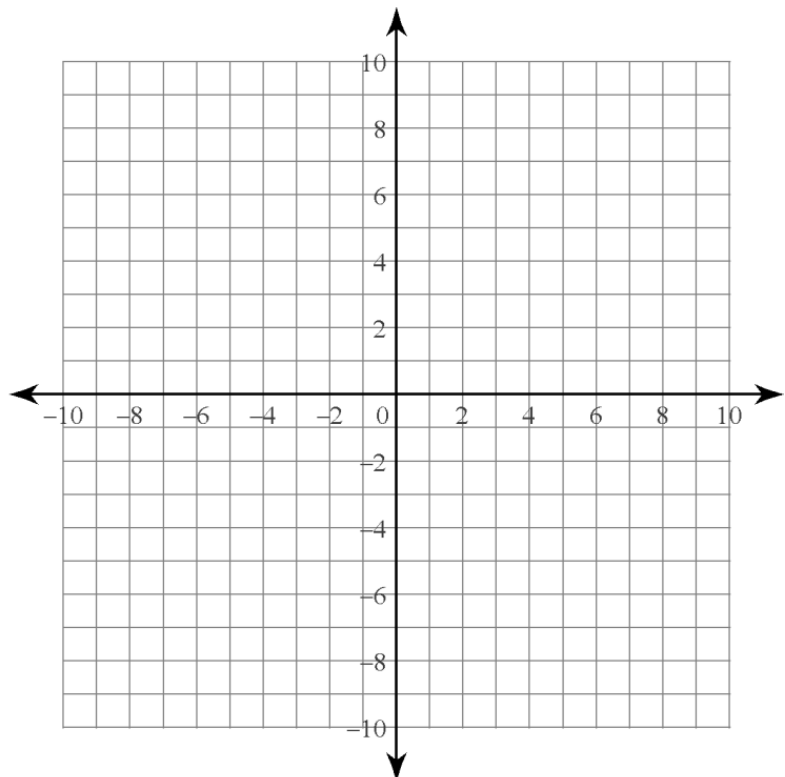
QUESTIONS:

The first graph that should have popped up is $y = x^2$. This is a VERY important parabola (I call it the "Mother-Function"). You need to be familiar with what this parabola looks like. Every other parabola is drawn in relation to this one. Draw the graph (accurately) below and define the parameters.

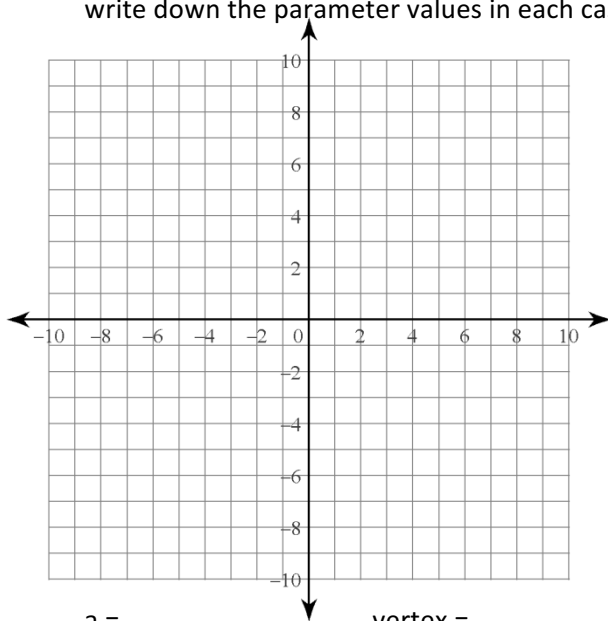
$a =$ vertex =

$h =$

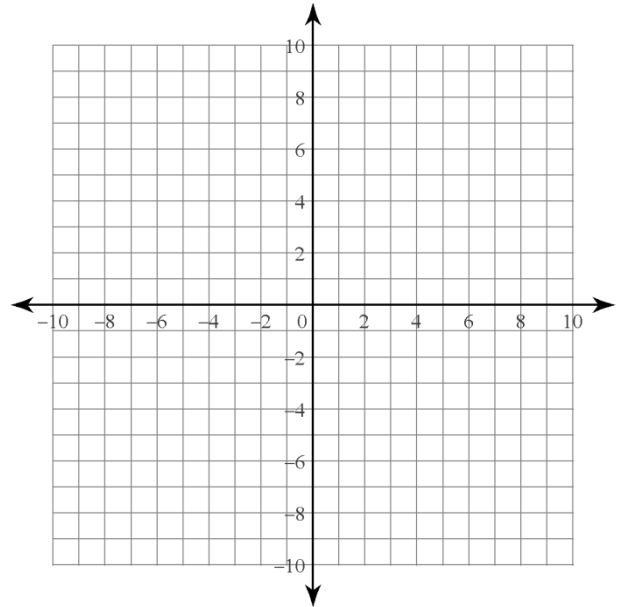
$k =$



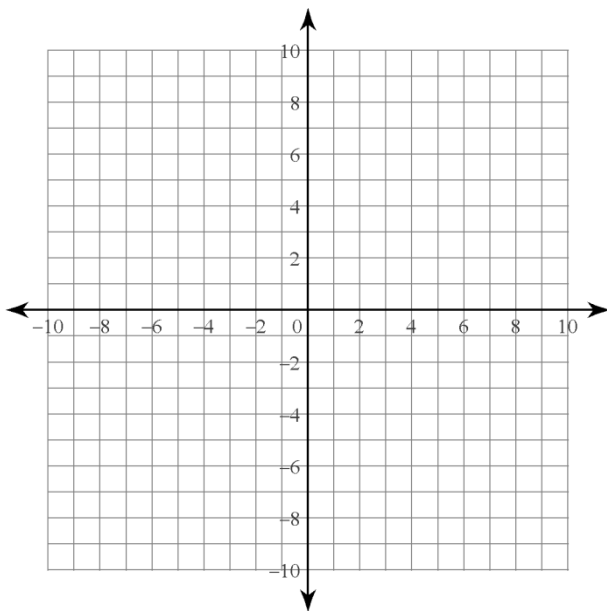
I want you to investigate what happens when a , h , and k change. Try each separately. Try them together in combinations. Slide them to positive values. Slide them to negative values. Slide them to 0. Slide them to big numbers. Slide them to decimal numbers (between -1 and 1). Draw four other graphs that are going to help you remember what the values a , h , and k do to a parabola. Draw them accurately and write down the parameter values in each case.



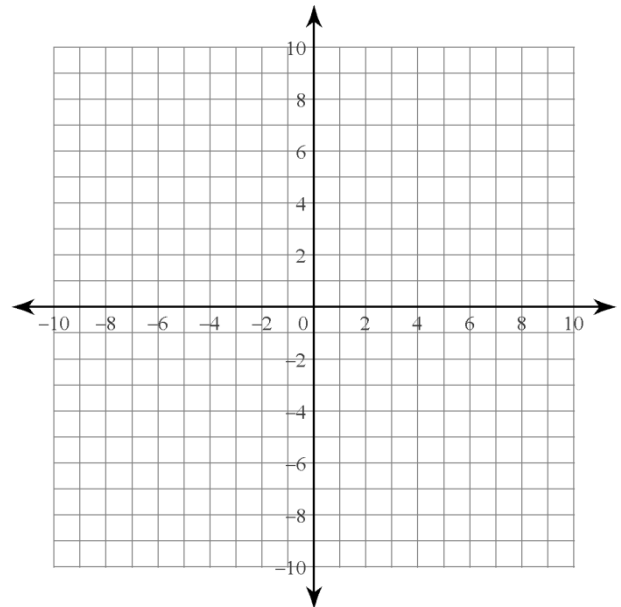
$a =$
 $h =$
 $k =$
 vertex =



$a =$
 $h =$
 $k =$
 vertex =



$a =$
 $h =$
 $k =$
 vertex =



$a =$
 $h =$
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