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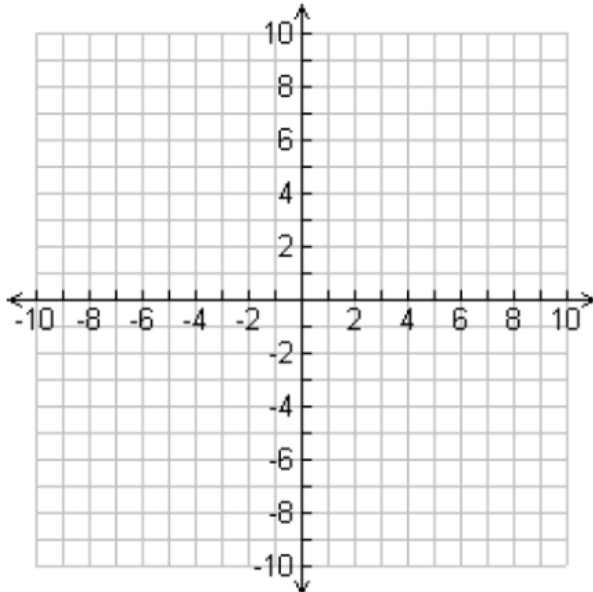
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Math Lab: Graphing Quadratic Equations in Standard Form

What are the characteristics of the parent graph of a quadratic function?

Complete the table and plot the points to sketch the graph of $y = x^2$.

x	$y = x^2$
-3	
-2	
-1	
0	
1	
2	
3	



The shape of a quadratic function is called a _____.

The highest or lowest point on the curve is the _____.

The _____ is the vertical line passing through the vertex.

The domain of $y = x^2$ is _____ and the range is _____.

What does a tell you about the graph of $y = ax^2 + bx + c$?

Graph each of the equations in a graphing calculator to complete the information in the table below. Enter $y = x^2$ in Y1 and each of the equations below in Y2 to compare them on the same graph.

Equation	Positive or negative a ?	Does the graph open up or down?	$ a $	Is the graph wider or narrower than $y = x^2$?	Coordinates of the points to the right and left of the vertex. (Use TRACE and enter the x value to find the y value.)
$y = 7x^2$					(-1,____) (1,____)
$y = \frac{1}{2}x^2$					(-1,____) (1,____)
$y = -\frac{1}{6}x^2$					(-1,____) (1,____)
$y = -\frac{3}{2}x^2$					(-1,____) (1,____)

- When a is positive, the parabola opens _____ and when a is negative, the parabola opens _____.
- When $|a| < 1$, the graph _____ and when $|a| > 1$, the graph _____.
- The slope from the vertex to the next guide point is $\frac{\text{rise}}{\text{run}} = \frac{\quad}{1}$ to the right and left of the vertex.

What do a and b tell you about the graph of $y = ax^2 + bx + c$?

Graph each of the equations in a graphing calculator to complete the information in the table below. Use the MAX or MIN option in the CALC menu to find the coordinates of the vertex. Round to the nearest integer.

Equation	Axis of symmetry $x = -\frac{b}{2a}$ (Show your work.)	Substitute $-\frac{b}{2a}$ in for x to find y . (Show your work.)	Vertex
$y = x^2 + 2x + 1$			
$y = -x^2 - 2x - 1$			
$y = -4x^2 + 8x + 2$			
$y = 2x^2 - 8x + 6$			
$y = 3x^2 - 18x + 20$			

- The equation $x = -\frac{b}{2a}$ finds the axis of _____ and the x-coordinate of the _____.
- To find the y-coordinate of the vertex, _____ x back in to $y = ax^2 + bx + c$.

What does c tell you about the graph of $y = ax^2 + bx + c$?

Graph each of the equations in a graphing calculator to complete the information in the table below. (Use TRACE and enter 0 for the x value to find the y-intercept.)

Equation	What is the y-intercept?
$y = x^2 + 3$	
$y = 2x^2 + 5$	
$y = -2x^2 + 4$	
$y = x^2 + 3x + 2$	
$y = -x^2 - 2x + 1$	

- The y-intercept of the parabola given in the form $y = ax^2 + bx + c$ is always $(0, \text{_____})$.