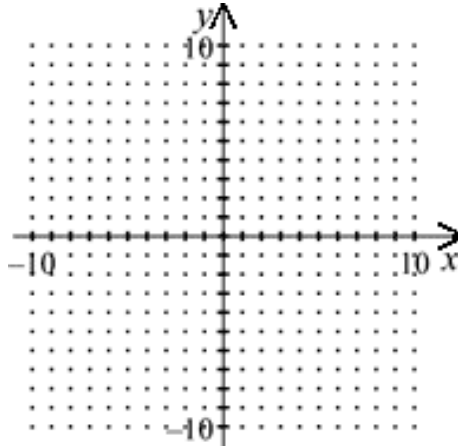Name: _____   Period: _____   Date: _____

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
-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.

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.

Equation	Positive or negative a?	Does the graph open up or down?	$|a|$	Is the graph wider or narrower than $y = x^2$?
$y = 7x^2$				
$y = \frac{1}{2}x^2$				
$y = -\frac{1}{6}x^2$				
$y = -\frac{3}{2}x^2$				

- When a is positive, the parabola _____.
- When a is negative, the parabola _____.
- When $|a| < 1$, the graph _____ and the slope from the vertex to the next point is a.
- When $|a| > 1$, the graph _____ and the slope from the vertex to the next point is a.

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.

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

- The equation $x = -\dfrac{b}{2a}$ is the _____ of the graph.
- To find the vertex,

_____

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.

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