Graphing Quadratic Equations in Vertex Form
Name: _____ Period: _____
This is your Notes: **DO NOT TURN THIS IN!**

Quadratic Equations

Standard Form
$f(x) = ax^2 + bx + c$

Axis of Symmetry, $x = -\frac{b}{2a}$

Vertex Form
$f(x) = a(x - h)^2 + k$

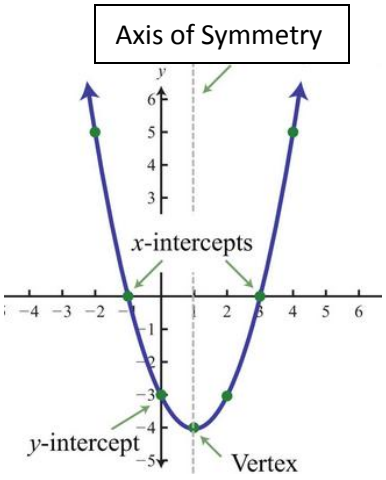
Axis of Symmetry, $x = h$
Vertex of the parabola (h, k)

Example 1
Find axis of symmetry and vertex.
$f(x) = -2(x - 4)^2 + 3$

Vertex (4, 3)
Axis of Symmetry, x = 4

Example 2
Find axis of symmetry and vertex.
$f(x) = (x + 7)^2 - 2$

Vertex (-7, - 2)
Axis of Symmetry, x = -7



The **x coordinate** of the **vertex** is **always opposite** the **sign**.

Practice 1
Find the axis of symmetry
$f(x) = 5x^2 - 20x + 30$

Practice 2
Find the axis of symmetry and vertex.
$f(x) = 3(x + 4)^2 - 7$

Vertex:
Axis of Symmetry:

Practice 3
Find the axis of symmetry and vertex.
$f(x) = -5(x - 3)^2 + 6$

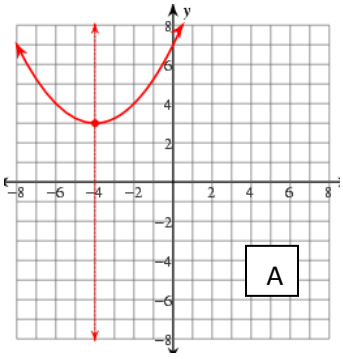
Vertex:
Axis of Symmetry:

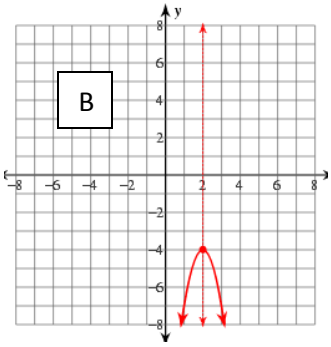
Example 3
Find the Graph for Each Equation

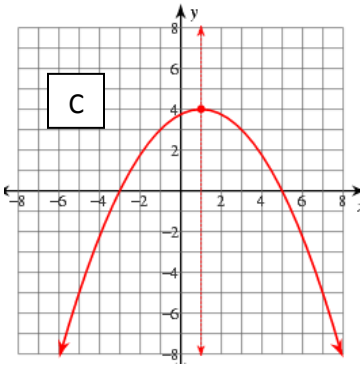
$$f(x) = -3(x-2)^2 - 4$$

$$f(x) = -\frac{1}{4}(x-1)^2 + 4$$

$$f(x) = \frac{1}{4}(x+4)^2 + 3$$

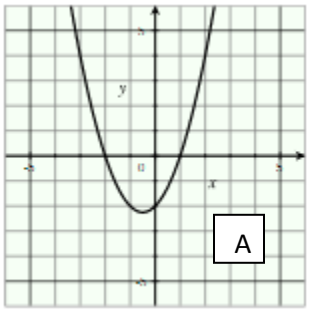


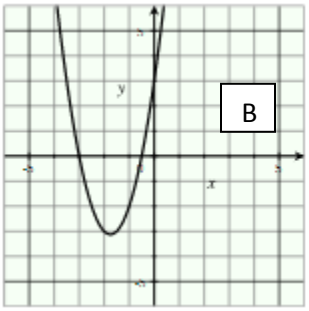


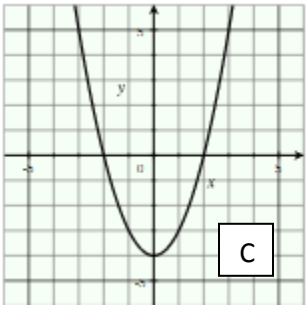


Example 4
Find the Graph for Each Equation.

$y = 2x^2 + 7x + 3$ $y = x^2 - 4$ $y = x^2 + x - 2$







How do you determine which graph corresponding to which equation?

What information can we draw from the equation to help finding the right graph?

Example 5
Find the vertex and sketch the graph.
$162x + 731 = -y - 9x^2$

Example 6
Find the vertex and sketch the graph.
$y = (x+5)(x+4)$

Practice 4
Find the vertex and sketch the graph.
$y = -x^2 - 14x - 59$

Practice 5
Find the vertex and sketch the graph.
$y + 6 = (x + 3)^2$