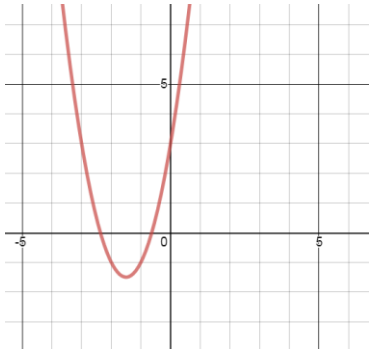
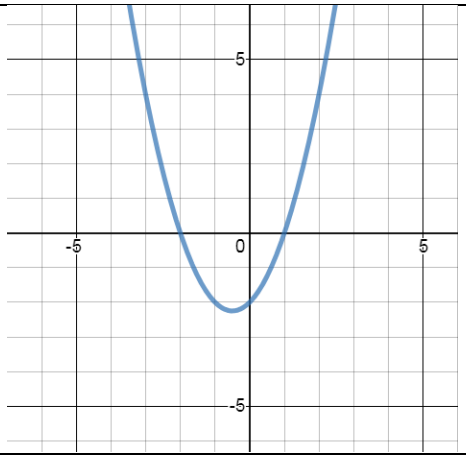
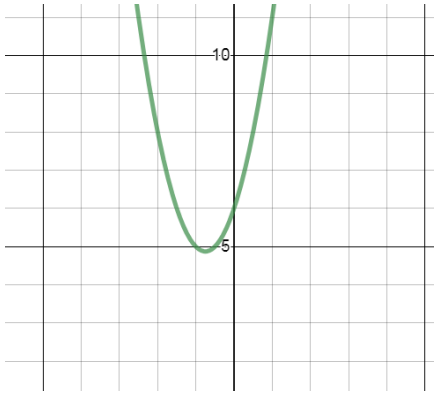
Topic 8.3 – Quadratic Functions in Standard Form

EXAMPLE 1 - Relate c to the Graph of $f(x) = ax^2 + bx + c$

What information does c provide about the graph of $f(x) = ax^2 + bx + c$?

$f(x) = 2x^2 + 6x + 3$	$f(x) = x^2 + x - 2$	$f(x) = 2x^2 + 3x + 6$
		

Finding the vertex from Standard Form:

The **standard form of a quadratic function** is $f(x) = ax^2 + bx + c$, where $a \neq 0$. The value c is the y-intercept of the graph.

Axis of symmetry/x-value of vertex:

Y-value of the vertex:

EXAMPLE 2 – Find the vertex of the quadratic in standard form.

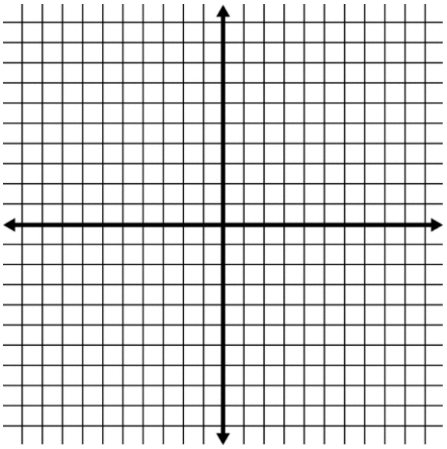
Graph $f(x) = -0.75x^2 + 3x - 4$.

Step 1.

Step 2.

Step 3.

Example 3 - Find the vertex and graph $f(x) = 2x^2 + 8x + 5$



Example 4 – Convert a Quadratic from Vertex to Standard Form:

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

1) Expand the binomial.
2) FOIL the binomials.
3) Distribute into the parenthesis.
4) Simplify.

Example 5– Cyndie is standing a platform 24 feet above the pool. She jumps off the platform and her height above the pool can be measured with the function $h(t) = -16t^2 + 8t + 24$, where *t* is the seconds after she jumped and *h* is her height over time.

a) What is her maximum height above the water?

b) How long does it take her to reach the maximum height?

Example 6- A ball is thrown into the air. The height of the ball, *h,* over *t* seconds can be modeled with the equation: $h(t) = -t^2 + 8t$.

a) How long does it take the ball to reach it's maximum height?

b) How high does it get?

You Try!

1) Find the vertex for the equation: $f(x) = x^2 - 4x + 8$

2) Find the vertex for the equation: $f(x) = -3x^2 - 12x + 1$