Unit 5 - Quadratic Functions

Day 13 Quadratics in Vertex Form

(PH Alg2 5-3)

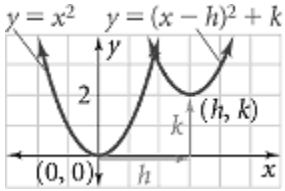
Name: _____

Date: _____ **Hour:** _____

Vertex Form: $f(x) = a(x - h)^2 + k$ **Standard Form:** $f(x) = ax^2 + bx + c$

Graph of a Quadratic Function in Vertex Form

The graph of $y = a(x - h)^2 + k$ is the graph of $y = ax^2$ translated h units horizontally and k units vertically.



- **h is "inside" the parenthesis and the graph moves right or left "opposite"**
- **k is "outside" and the graph moves up or down the "same"**
- **The vertex is (h, k), and the axis of symmetry is the line $x = h$.**

Example 1: Using Vertex Form to Graph a Parabola

a. Graph $y = 2(x + 1)^2 - 4$

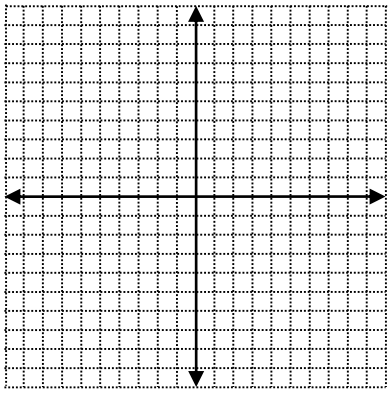
***Step 1*:** Graph the vertex point (___ , ___)

***Step 2*:** Find and sketch the axis of symmetry. _____

***Step 3*:** Find and plot the y-intercept point (0 , ____)

***Step 4*:** Reflect the y-intercept over the axis of symmetry to obtain another point.

***Step 5*:** Sketch the curve.



b. Graph $y = -\frac{1}{2}(x - 2)^2$

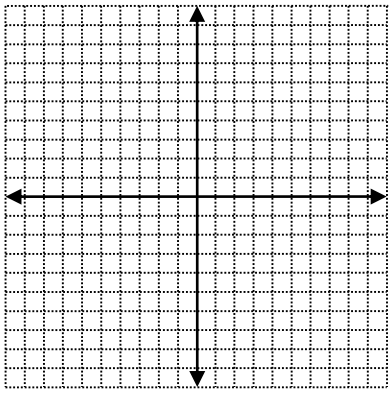
***Step 1*:** Graph the vertex point (___ , ___)

***Step 2*:** Find and sketch the axis of symmetry. _____

***Step 3*:** Find and plot another point (____ , ____)

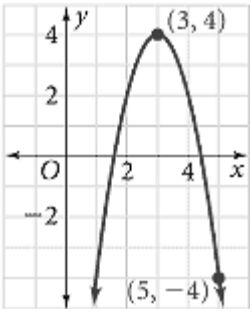
***Step 4*:** Reflect this other point over the axis of symmetry to obtain new point.

***Step 5*:** Sketch the curve.

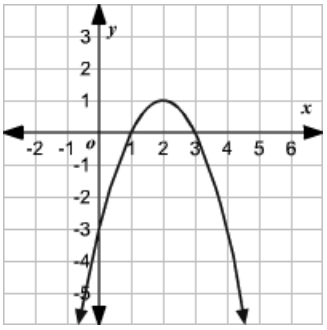


Example 2: Writing the Equation of a Parabola

a. Write the equation of the parabola at the right.



b. Write the equation of the parabola at the right.



Homework: Day 13 Worksheet