Name:_____Date:_____Period:____

4-1 Quadratic Functions and Equations

Standards

A2.F.BF.A.1 Write a function that describes a relationship between two quantities.

A2.F.BF.A.1a Determine an explicit expression, a recursive process, or steps for calculation from a context.

A2.F.BF.A.1b Combine standard function types using arithmetic operations.

Key Concepts

_____ - a function that can be written in the standard form

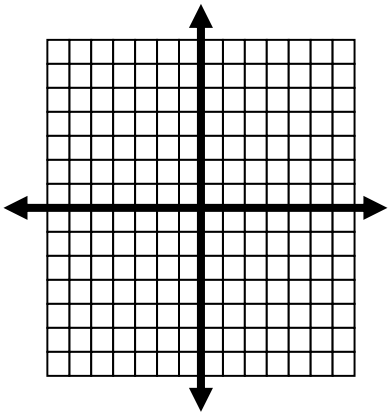
$f(x) = ax^2 + bx + c$, where $a \neq 0$

_____ - the graph of a quadratic function

_____- vertex form of a parabola where (*h, k*) is the vertex.

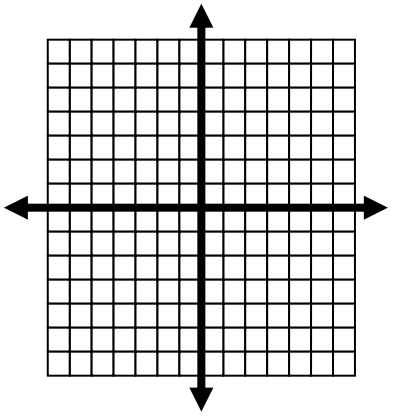
Examples

x	*f(x)*

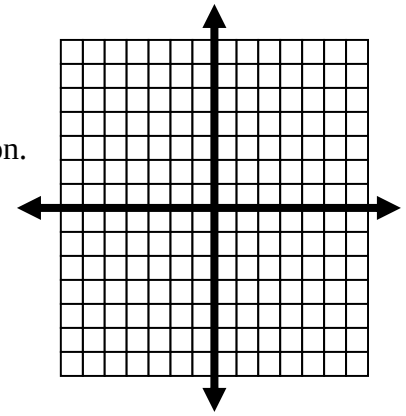


1. (I do) Graph $f(x) = x^2$
   a. Identify the vertex.
   b. Identify the axis of symmetry.
   c. Identify the maximum or minimum value.

2. (We do) Graph the translation $f(x) = x^2 - 5$
   a. Describe how the graph is a translation of the parent function $y = x^2$
   b. Identify the vertex. Is it a maximum or minimum?
   c. Identify the axis of symmetry.
   d. State the maximum or minimum value.



3. (They do) Graph the transformation $g(x) = -\frac{1}{3}x^2 + 2$

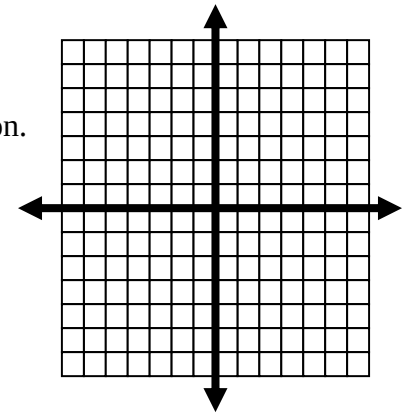


   a. Describe how the graph is a transformation of the parent function.

   b. Identify the vertex. Is it a maximum or minimum?

   c. Identify the axis of symmetry.

4. (They do) Graph the transformation $g(x) = -2(x + 1)^2 + 4$



   a. Describe how the graph is a transformation of the parent function.

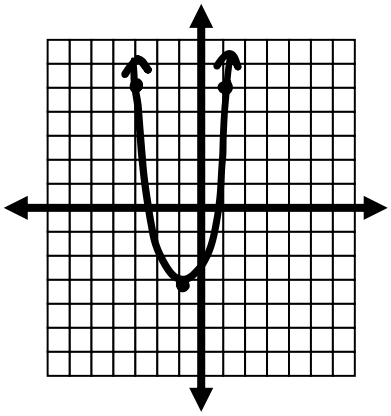
   b. Identify the vertex. Is it a maximum or minimum?

   c. Identify the axis of symmetry.

   d. What is the minimum or maximum value?

   e. State the domain and range of the function.

5. (They do) Write an equation to model the graph through vertex (-1, -3) & (-3, 5).



You do Practice 4-1: Complete your assignment on a separate sheet of paper. Show work.

1. Graph each function, describe the transformation, identify the vertex, axis of symmetry, maximum or minimum value, domain and range.

   a. $y = -x^2$ b. $y = -x^2 - 7$ c. $y = (x + 1)^2 - 4$

2. When does the graph of a quadratic function have a minimum value?

3. Describe the similarities and differences between the graphs of $y = -(x + 6)^2 - 7$ and $y = (x + 6)^2$

4. Write the equation for the parabola with vertex (-4, -4) through (-2, 0).