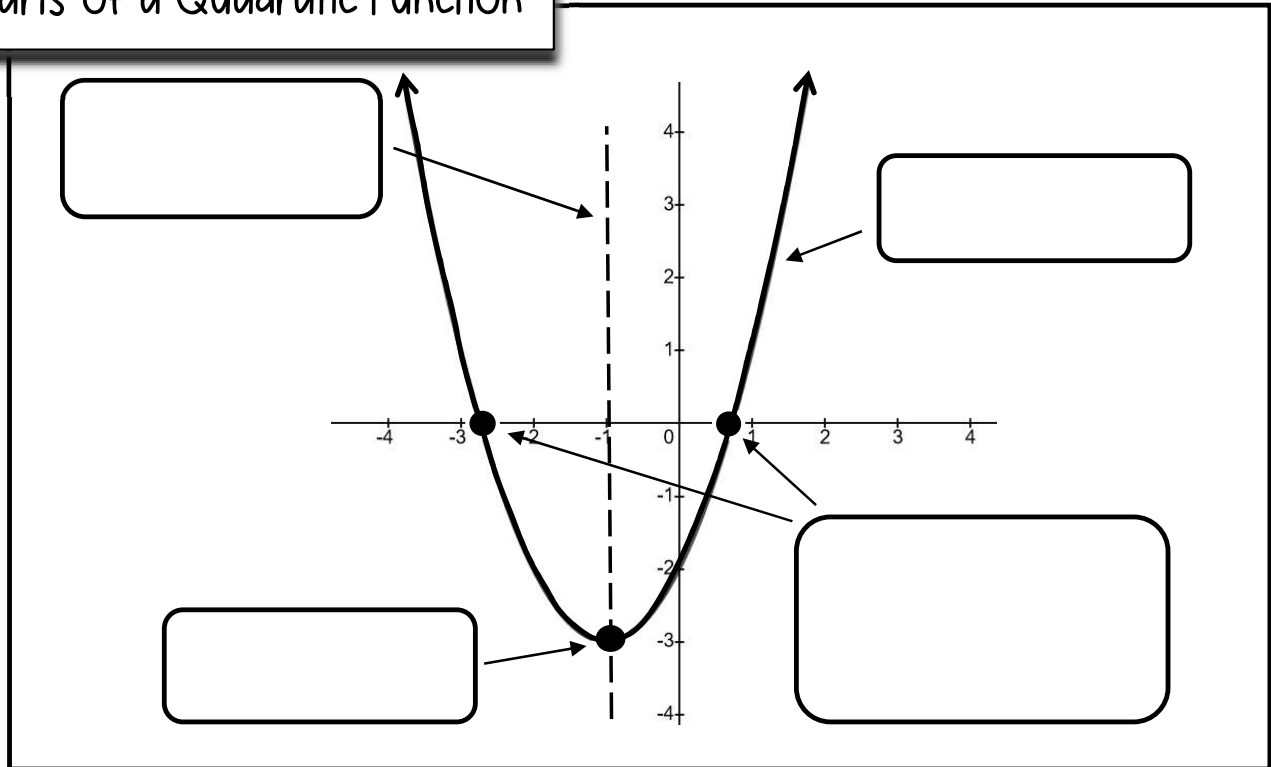


NOTES: INTRODUCTION TO Quadratic Functions

Parts of a Quadratic Function



Standard vs. Vertex Form

Standard Form

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

$$f(x) = 2x^2 + 5x - 3$$

$$a = \underline{\quad} \quad b = \underline{\quad} \quad c = \underline{\quad}$$

Vertex Form

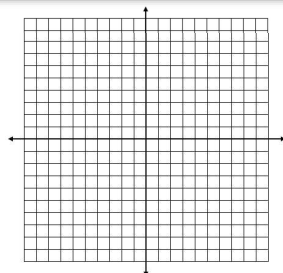
$$f(x) = a(x - h)^2 + k$$

$$\text{vertex: } \left(\begin{matrix} \uparrow \\ \quad \end{matrix} , \begin{matrix} \uparrow \\ \quad \end{matrix} \right)$$

Linear vs. Quadratic Parent Functions

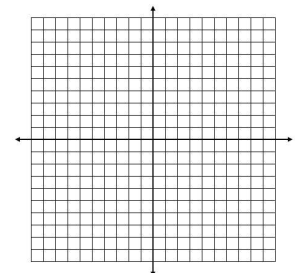
Linear

$$f(x) = x$$



Quadratic

$$f(x) = x^2$$



Definitions

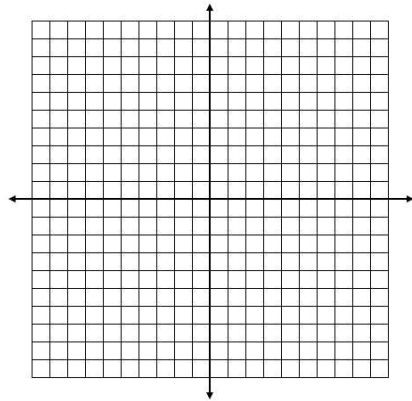
Axis of Symmetry

WHAT IS IT?

ALWAYS PASSES THROUGH THE

FORMULA:

Graph a Quadratic with $x = 4$ as the axis of symmetry



Vertex

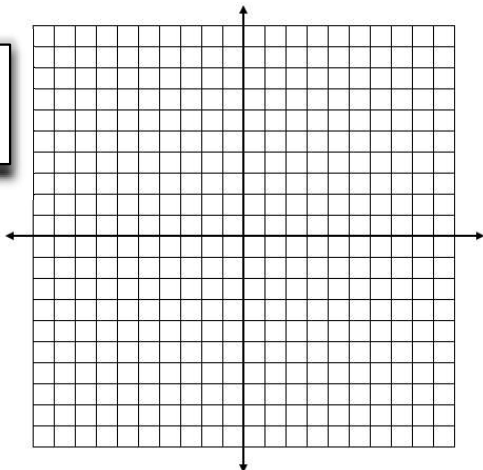
The vertex is the _____ or _____ part of a graph.

y-value of vertex is determined by plugging in AOS value for x:

How do we know if the parabola opens UP or DOWN?

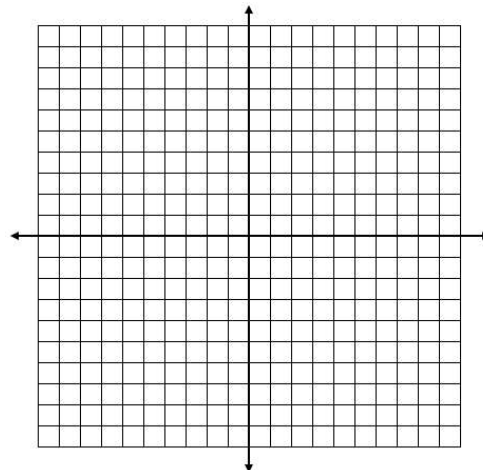
When the parabola opens up, the "a" value is positive, and the vertex is known as a

$$f(x) = x^2$$



When the parabola opens down, the "a" value is negative, and the vertex is known as a

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



Parent Function

Examples

Use the formulas to determine the vertex and axis of symmetry for each quadratic function. Then draw a rough sketch of the parabola on the graph provided.

$$x = \frac{-b}{2a}$$

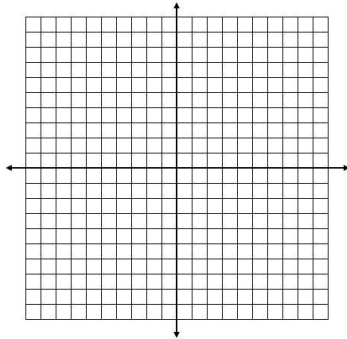
1. $f(x) = x^2 + 10x + 15$

Axis of Symmetry:

a= ____ **b=** ____ **c=** ____

Vertex:

Graph:



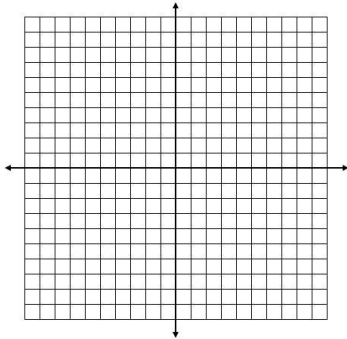
2. $f(x) = -2x^2 - 8x - 15$

Axis of Symmetry:

a= ____ **b=** ____ **c=** ____

Vertex:

Graph:



Your axis of symmetry is always $x = \frac{-b}{2a}$ (the y-axis)

What if there is no "b" value?

Determine the axis of symmetry for the following quadratic function. Then determine the vertex.

$$f(x) = x^2 - 5$$

a= ____ **b=** ____ **c=** ____

A. INTRODUCTION TO Quadratic Functions

Determine the vertex and axis of symmetry for each quadratic function. Then draw a rough sketch on the graph provided.

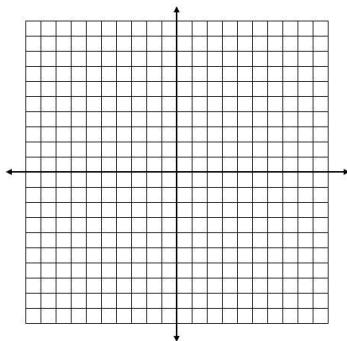
1. $f(x) = 2x^2 + 12x + 11$

$a = \underline{\quad}$ $b = \underline{\quad}$ $c = \underline{\quad}$

Axis of Symmetry: _____

Vertex: _____

Graph:



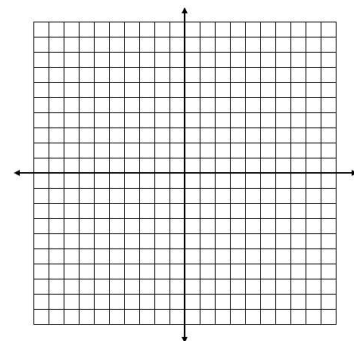
2. $f(x) = -x^2 - 2x + 3$

$a = \underline{\quad}$ $b = \underline{\quad}$ $c = \underline{\quad}$

Axis of Symmetry: _____

Vertex: _____

Graph:



$$x = \frac{-b}{2a}$$

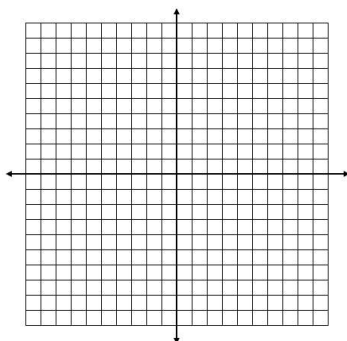
3. $f(x) = x^2 + 4x$

$a = \underline{\quad}$ $b = \underline{\quad}$ $c = \underline{\quad}$

Axis of Symmetry: _____

Vertex: _____

Graph:



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

$a = \underline{\quad}$ $b = \underline{\quad}$ $c = \underline{\quad}$

Axis of Symmetry: _____

Vertex: _____

Graph:

