Bellwork

Factor each of the following expressions:

1. $-70b^2 + 19b + 21$

2. $196x^2 - 121$

Graphing Quadratic Equations - Key Elements

What will you need to graph the given functions?

1. The Axis of Symmetry (AOS)
2. A table of values revolved around the AOS
3. Identify the Vertex
4. Identify the X-intercept
5. Identify the Y-intercept

Axis of Symmetry

Procedure:

Given that the equation is in standard form...

$y = ax^2 + bx + c$

Step 1: Identify the opposite of the b value.

Step 2: Identify twice the a value.

Step 3: Set up the equation...

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

Step 4: Reduce and plot on the graph as a dashed line (Will be a vertical line!)

Creating a Table of Values

Procedure:

Step 1: Create a T-chart that will fit 7 values.

Step 2: Put the value of the AOS in the middle placement.

Step 3: Identify 3 numbers to the left of the AOS and put them above the middle.

Step 4: Identify 3 numbers to the right of the AOS and put them below the middle.

Step 5: Plug each of the values listed in the chart into the equation and list the result right next to it.

Identify the Vertex

Vertex - The point that is the lowest or the highest point of a quadratic function.

Procedure:
Step 1: Identify the middle point in the chart.
Step 2: Graph this point.

Identify the X-intercept

X-intercept: The point(s) where the function crosses the x-axis.

Procedure:

Step 1: If the graph indicates an actual point, Identify that specific point.

Step 2: If your graph does not indicate a point state that the x-intercept is between 2 integers.

(Ex. If the line crosses at around 2.3, Then you state $2 < x < 3$)

Identify the Y-intercept

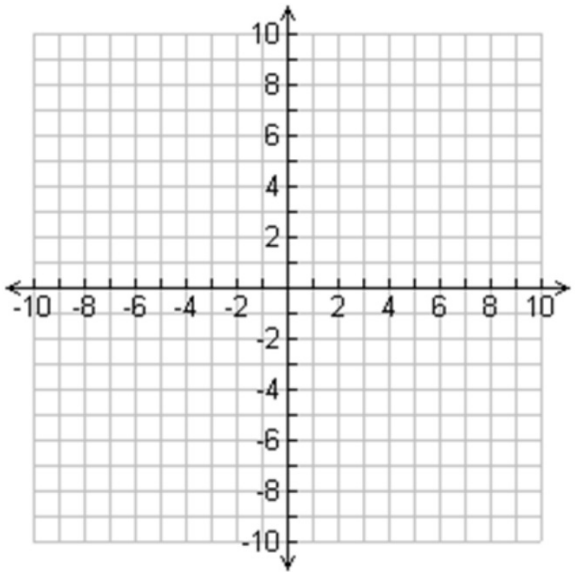
Y-intercept: The point where the function crosses the y-axis.

Procedure:
Step 1: Plug in 0 for all of the x's
Step 2: Solve for y.

Example

Graph the following function:

1. $y = 2x^2 + 4x - 9$



Example

Graph the following function:

1. $y = -3x^2 - 3x + 6$