Lesson 8.5- SWBAT list key components and graph a quadratic function.

Kick off-

1) Graph each of the following (using any method)

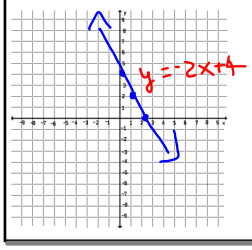
a) $y + 2x = 4$

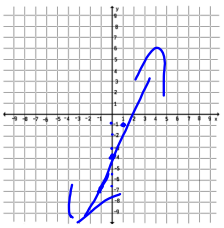
$-2x \quad -2x$

$y = -2x+4$

c) $5y = 15x - 20$

$y = 3x-4$



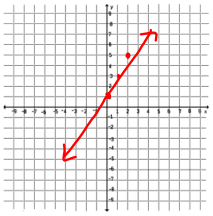


Graph each of the following using slope-intercept form.

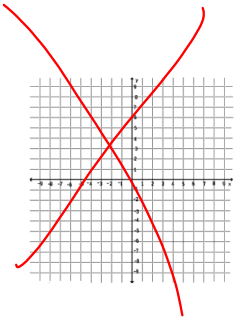
1) $y = 2x + 1$

$m = 2/1$

$b = 1$



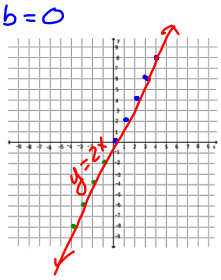
2) $9x + 3y = 7$



3) $y = 2x$

$m = \frac{2}{1}$

$b = 0$

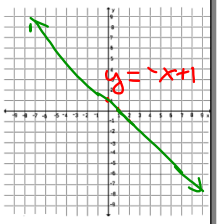


4) $x + y = 1$

$-x \quad -x$

$y = -x+1$

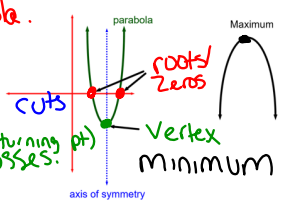
$m = -1/1 \quad b = 1$



Quadratic Functions

The shape is a parabola.

$$y = ax^2 + bx + c$$



Axis of Symmetry- the line that cuts the parabola in half.

The vertex is the point that the axis of symmetry crosses. (turning pt)

The roots where the parabola crosses the x-axis.

Identify a, b, and c in the quadratic function: $y = x^2 + 3x - 5$.

$a=1 \quad b=3 \quad c=-5$

Find the axis of symmetry for each of the following: $x = -\frac{b}{2a}$

1) $y = x^2 - 6x + 8$

$a=1 \quad b=-6 \quad c=8$

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

$x = \frac{-(-6)}{2(1)}$

$x = \frac{6}{2}$

$x = 3$

2) $y = -x^2 - 4x + 5$

$a=-1 \quad b=-4 \quad c=5$

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

$x = \frac{-(-4)}{2(-1)}$

$x = \frac{4}{-2}$

$x = -2$

3) $y = 2x^2 - 8x + 7$

$a=2 \quad b=-8 \quad c=7$

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

$x = \frac{-(-8)}{2(2)}$

$x = \frac{8}{4} \rightarrow x = 2$

Graphing the Quadratic Function: $y = x^2 - 6x + 5$

Step 1: Solve for y

Step 2: Find the axis of symmetry ($x = -\frac{b}{2a}$)

Step 3: Create the table to plot order pairs (from axis of symmetry; 2 above and 2 below)

Step 4: Plot and connect the points. LABEL the graph with the equation!

1) $y = x^2 - 6x + 5$

Axis of Symmetry:

$a=1 \quad b=-6 \quad c=5$

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

$x = \frac{-(-6)}{2(1)}$

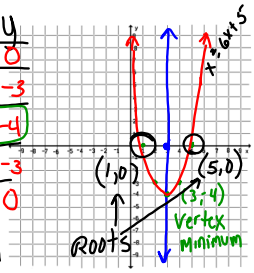
$x = \frac{6}{2}$

$x = 3$

Table:

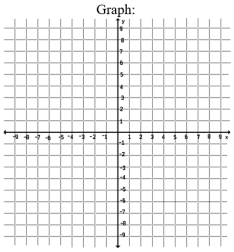
x	x^2-6x+5	y
1	$(1)^2-6(1)+5$	0
2	$(2)^2-6(2)+5$	-3
3	$(3)^2-6(3)+5$	-4
4	$(4)^2-6(4)+5$	-3
5	$(5)^2-6(5)+5$	0

Graph:



Directions: Graph each quadratic function, label the vertex, roots and state the minimum or maximum.

1) Graph $y = 3x^2 - 6x + 5$
Axis of Symmetry: Table: Graph:

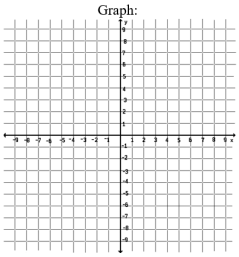


$a =$
$b =$
$c =$

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

2) Graph $y = -x^2 - 4x + 5$

2) Graph $y = -x^2 - 4x + 5$
Axis of Symmetry: Table: Graph:



3) Graph $y = -x^2 + 6x - 7$
Axis of Symmetry: Table: Graph: