9.2 Quadratic Functions - Day 1

Review from 9.1

* In the quadratic function $y=ax^2+bx+c$, the value of "b" affects the position of the line/axis of symmetry. (Review #3 from 9.1 packet)

* See graphs on pg. 553

* The line/axis of symmetry changes as the "b" value changes therefore...

The graph of $y=ax^2+bx+c$, where $a \neq 0$, has the line $x=\frac{-b}{2a}$ as its axis of symmetry. The x-coordinate of the vertex is $\frac{-b}{2a}$.

* Use this information to graph a quadratic function. Steps:

1) Find the axis of symmetry & vertex (1st ordered pair)
2) Find the y-intercept (2nd ordered pair)
3) Find a 3rd ordered pair
4) graph & reflect the points

Example: $y = x^2 - 6x + 9$

(1) Find the axis of symmetry & vertex

axis of symmetry $x = \frac{-b}{2a}$

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

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

$x = 3$

Vertex = $(3, ?)$

$y = x^2 - 6x + 9$

Use substitute to find the y-coordinate of the vertex

$y = 3^2 - 6(3) + 9$

$y = 9 - 18 + 9$

$y = 0$

Vertex = $(3, 0)$ (1st ordered pair)

(2) Find the y-intercept, let $x = 0$

$y = x^2 - 6x + 9$

$y = 0^2 - 6(0) + 9$

$y = 9$

y-intercept & 2nd ordered pair = $(0, 9)$

(3) Find another ordered pair by choosing a value of "x" on the same side of the vertex as the y-intercept

Let $x = 1$, $y = x^2 - 6x + 9$

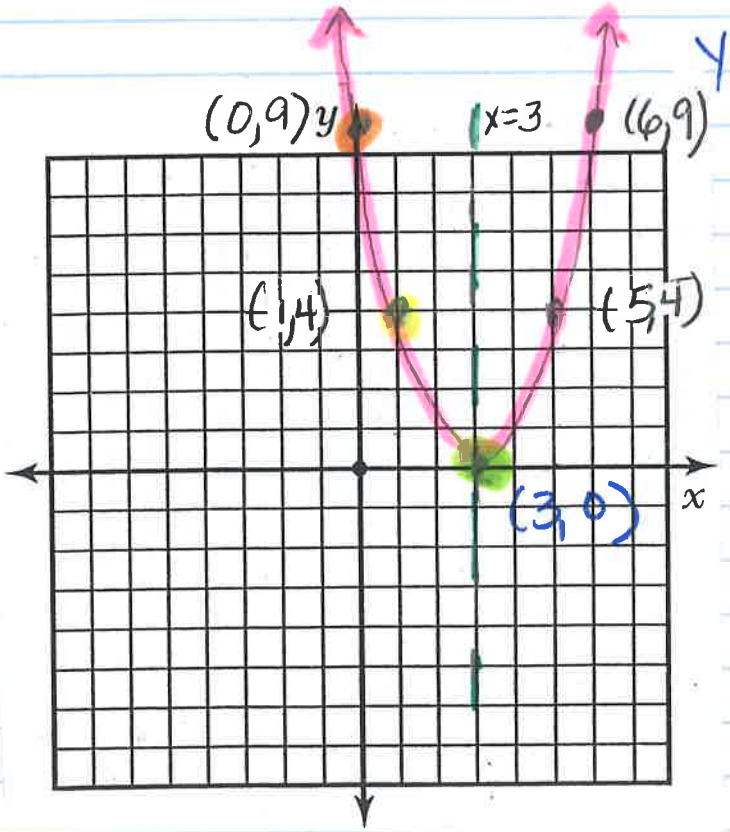
$y = 1^2 - 6(1) + 9$

$y = 1 - 6 + 9$

$y = 4$

(1, 4) 3rd ordered pair

(4) Graph & Reflect the points



* Complete Got it #1 on pg. 554.

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

$x = \frac{-b}{2a}, \quad \frac{-4}{2(-1)} = \frac{-4}{-2} = 2$

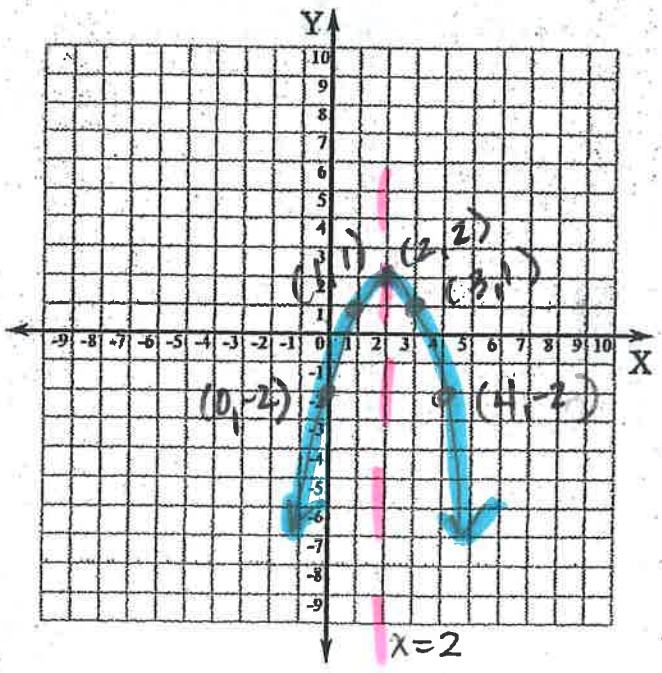
$x = 2$ (line/axis of symmetry)

- $y = -x^2 + 4x - 2$
$y = -(2)^2 + 4(2) - 2$
$y = -4 + 8 - 2$
$y = 2$ $\quad (2, 2)$

- $y = -x^2 + 4x - 2$
$y = 0^2 + 4(0) - 2$
$y = -2$ $\quad (0, -2)$

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

$(1, 1)$



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

1B) It is easy to find the y-intercept b/c $x = 0$

Remember to include the following on all parabolas.

1) Arrows (unless this is a word problem & arrows do not make sense in the context of the problem.)

2) at least 3 ordered pairs where 1 is the vertex.

3) Draw the parabola through the ENTIRE coordinate plane.

4) Label: - the parabola with the equation
- the line of symmetry
- all 3 ordered pairs