**Algebra 9-2: Quadratic Equations $y = ax^2 + bx + c$**

Warm-Up

Graph without a calculator.

1. $y = (-1/4)x^2$
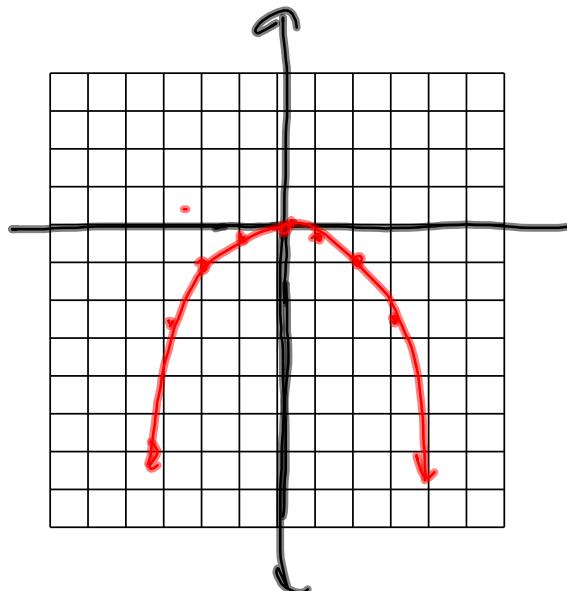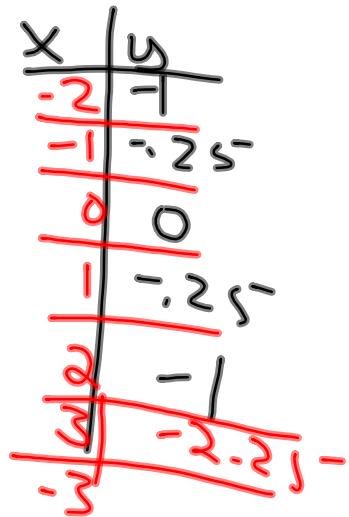
Algebra 9-2: Quadratic Equations $y = ax^2 + bx + c$

Graph without a calculator. Make a __Table__ Use x values -3, -2, -1, 0, 1, 2, 3. Find their corresponding __y__ - __values__. Remember to use __pemdas__ when solving.

1. $y = -2x^2 - 1$

$-2(-3)^2 - 1$
$-2(-2)^2 - 1$
$-2(-1)^2 - 1$

| x	y
-3	-19
-2	-9
-1	-3
0	-1
1	-3
2	-9
3	-19

a. Identify the vertex. __(0, -1)__

b. Is there a max or min? __max__

c. Identify the y-intercept. __-1 or (0, -1)__

d. Identify the x-intercept. __none__

e. Identify the line of symmetry. __X = 0__

f. What are the x-coordinates when y = -3? __X = -1, -1__
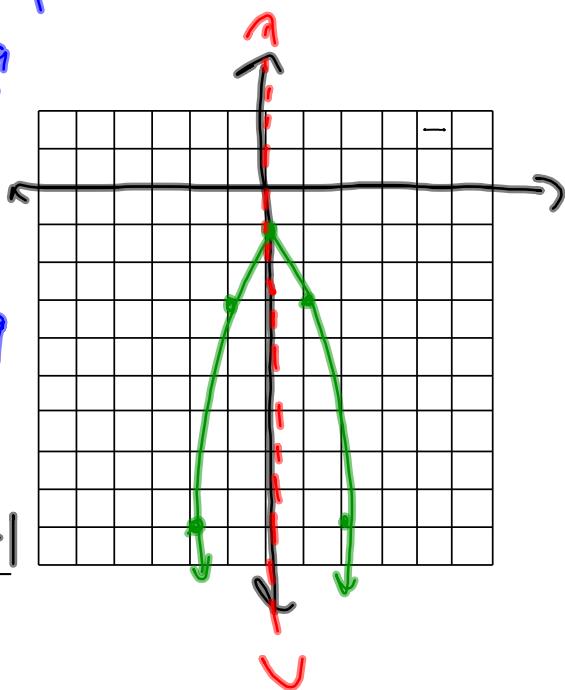
$$y = a^2 + bx + c$$

2. $y = x^2 - 2x - 3$

a. Identify the vertex. $(1, -4)$

b. Is there a max or min? min

c. Identify the y-intercept. $(0, -3)$ $y = -3$

d. Identify the x-intercept. $(-1, 0)$ & $(3, 0)$
   or $x = -1, 3$

e. Identify the line of symmetry. $x = -1$
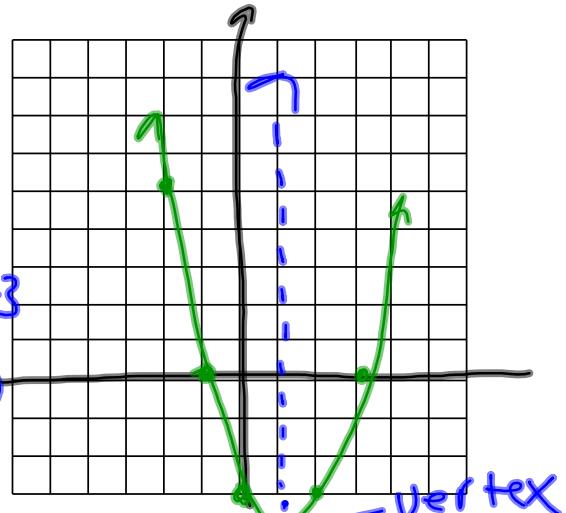
x	y
-3	12
-2	5
-1	0
0	-3
1	-4
2	-3
3	0

vertex

$(-3)^2 - 2(-3) - 3 = 9 + 6 - 3 = 12$

$(-2)^2 - 2(-2) - 3 = 4 + 4 - 3 = 5$

$(-1)^2 - 2(-1) - 3 = 1 + 2 - 3 = 0$

$(0)^2 - 2(0) - 3 = 0 - 0 - 3 = -3$

$(1)^2 - 2(1) - 3 = 1 - 2 - 3 = -4$

$(2)^2 - 2(2) - 3 = 4 - 4 - 3 = -3$

$(3)^2 - 2(3) - 3 = 9 - 6 - 3 = 0$

What do you notice?

- a, b, and c will affect ___the vertex, where the parabola is located.___

- parabola is ___symmetrical___

- a > 0 then ___opens up___

- a < 0 then ___opens down___

Assignment: 9-2 #'s 1-9, 12-19, 4 graphs

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

a > 0 +) ⤴

a < 0 -) ⤵