Lesson 3.1.1

Saturday, February 4, 2017 4:39 PM

PREC 11 **3.1 Investigating Quadratic Functions in Vertex Form**

x	y
-2	4
-1	1
0	0
1	1
2	4

The graph of $y = x^2$ is a parabola with the following properties:

i. vertex (0, 0)

ii. y-intercept (0, 0)

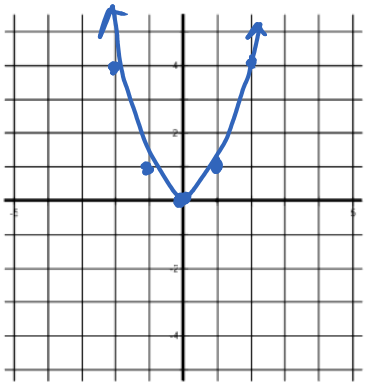
iii. x-intercept (0, 0)

iv. opening upward

v. axis of symmetry $x = 0$

vi. domain $x \in \mathbb{R}$

vii. range $y \geq 0$



moves parabola up or down

The graph of $y = x^2 + q$ is a parabola with the following properties:

i. vertex $(0, q)$

ii. y-intercept q

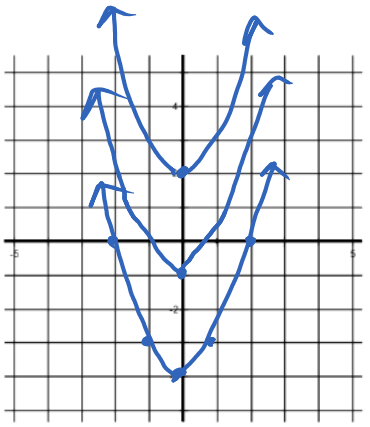
iii. x-intercept varies

iv. opening up

v. axis of symmetry $x = 0$

vi. domain $x \in \mathbb{R}$

vii. range $y \geq q$



ex) $y = x^2 - 4$

$y = x^2 + 1$

$y = x^2 - 3$

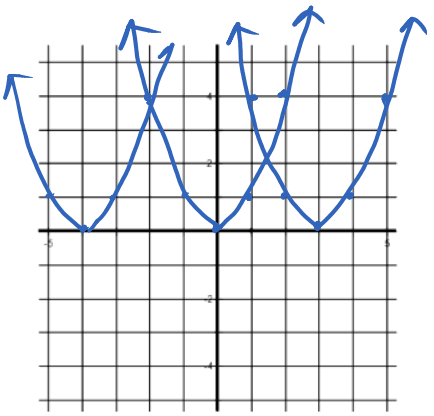
The graph of $y = x^2$ is simply moved up or down by the value of q.

moves the graph left to right

The graph of $y=(x-p)^2$ is a parabola with the following properties:

opposite sign

i.	vertex	$(p,0)$
ii.	y-intercept	varies
iii.	x-intercept	p
iv.	opening	up
v.	axis of symmetry	$x=p$
vi.	domain	$x \in \mathbb{R}$
vii.	range	$y \geq 0$



ex) $y=(x-3)^2$

$y=(x+1)^2$

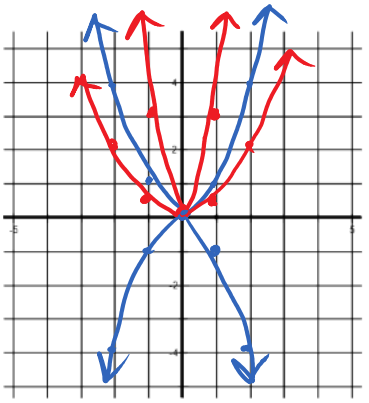
$y=(x+4)^2$

The graph of $y=x^2$ is simply translated left or right by the value of *p*.

(direction is opposite to sign)

The graph of $y=ax^2$ is a graph with the following properties:

i.	vertex	$(0,0)$
ii.	y-intercept	0
iii.	x-intercept	0
iv.	opening	up or down
v.	axis of symmetry	$x=0$
vi.	domain	$x \in \mathbb{R}$
vii.	range	depends



The graph of $y=x^2$ is simply expanded (a>1) or compressed (0<a<1) vertically.

negative a

positive a

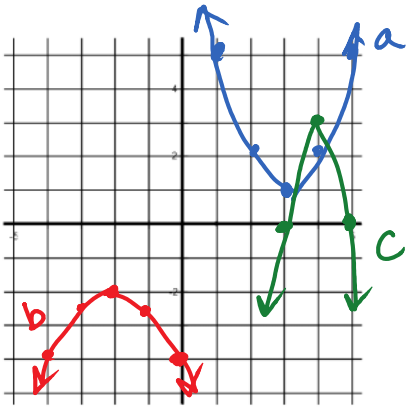
Example 1: Graph:

a. $y = (x-3)^2 + 1$

b. $y = -\frac{1}{2}(x+2)^2 - 2$

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

d. _____

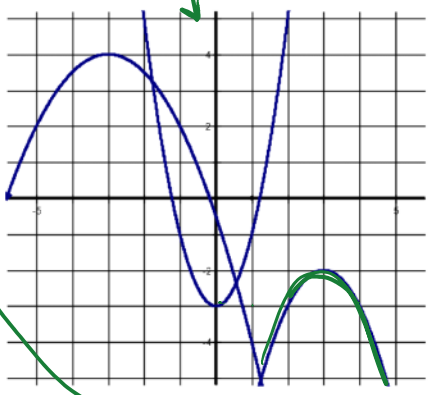


Example 2: Write an equation that could represent each graph:

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

b. $y = -(x-3)^2 - 2$

c. $y = -\frac{1}{2}(x+3)^2 + 4$



Assignment: pg. 157 ~~#1, 2, 3ac, 4, 5, 8~~ 4, 5, 8