Graphing Quadratics – Standard Form

Quadratic Form: $y = ax^2 + bx + c$

'a' makes the graph move, neg. 'a' opens down and pos. 'a' opens up.

Squared makes it graph as quadratic named a parabolic function.

'c' Slides the graph a number of units.

'A of S' means Axis of Symmetry.

To find the vertex you must use the formula:

$$x = \frac{-b}{2a} \leftarrow (AOS)$$

Which is now the x in the vertex (x,y).

plug in x to get y for vertex

To find the y-intercept we find the value of c.

Steps to Graph a Quadratic in Std Form

1. Find AOS
2. Use "x" and plug in to quadratic to find y
3. Plot both
4. Choose two x-values to use to find ~~_____~~.
5. Plot

Ex1. $y = x^2 + 6x + 6$

Vertex	(-3,-3)
Max/Min Value	Min is -3 @ x = -3
AOS	x = -3
Zero(s)	-1.5, -4.5
Opens	up
y-intercept	(0,6)
Domain	$(-\infty, \infty)$
Range	$[-3, \infty)$

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

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

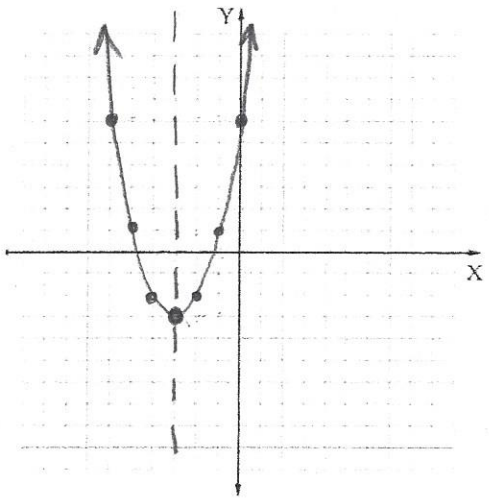
$x = -3$

$(-3)^2 + 6(-3) + 6$

$9 - 18 + 6$

$y = -3$

1	1
2	4
3	9



Ex. 2) $y = 2x^2 - 12x + 17$

Vertex	(3,-1)
Max/Min Value	Min is -1 @ x=3
AOS	x=3
Zero(s)	2.5, 3.5
Opens	up
y-intercept	(0,17)
Domain	$(-\infty, \infty)$
Range	$[-1, \infty)$

$X = \frac{12}{2(2)}$

$= \frac{12}{4}$

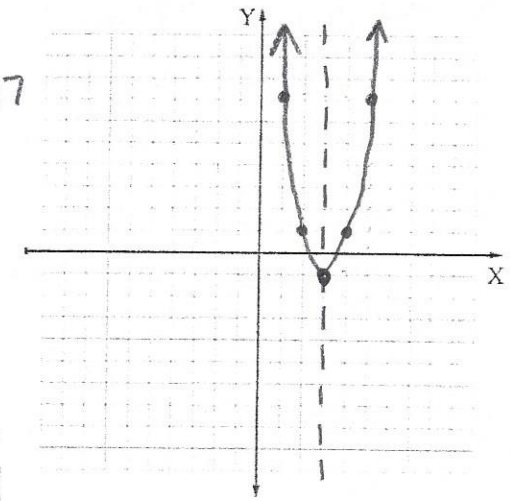
$X = 3$

$2(3)^2 - 12(3) + 17$

$18 - 36 + 17$

$y = -1$

X	y
1	1=2
2	4=8
3	9=18



Ex 3) $y = \frac{1}{2}x^2 - 2x + 6$

Vertex	(2,4)
Max/Min Value	Min is 4 @ x=2
AOS	x=2
Zero(s)	None
Opens	up
y-intercept	(0,6)
Domain	$(-\infty, \infty)$
Range	$[4, \infty)$

$X = \frac{2}{2(\frac{1}{2})}$

$= \frac{2}{1}$

$X = 2$

$\frac{1}{2}(2)^2 - 2(2) + 6$

$2 - 4 + 6$

$y = 4$

1	$1 = \frac{1}{2}$
2	4=2
3	$9 = 4\frac{1}{2}$
4	16=8