Graphing Quadratic Function ---- Parabolas

I will ask for at least five points:

- The Vertex
- Two points on either side of the vertex

Properties that will help you graph:

- Line of Symmetry
- y-intercept

Equation for the LOS:

Using a Quadratic in Standard Form: $y = ax^2 + bx + c$

$$\text{LOS:} \quad x = \frac{-b}{2a}$$

Find the vertex and plot this point: (x, y)

Same value as LOS

evalute the equation using the x from LOS

Find and plot the y-intercept (if it fits):

Using a Quadratic in Standard Form: $y = ax^2 + bx + c$

the y-intercept is C

If equation isn't in Standard Form, find the y-intercept by making x=0 and finding the value of y

Find the remainder of the Five points by

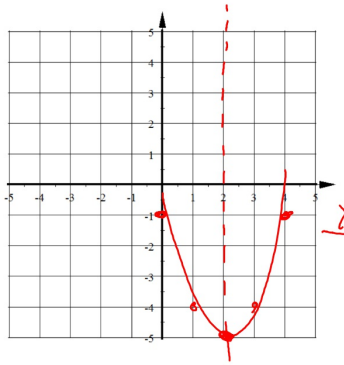
using a table of values and their reflections over the LOS

Graph this Quadratic:

$y = x^2 - 4x - 1$

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

$(2, -5)$



x	y
1	-4

Graph this Quadratic:

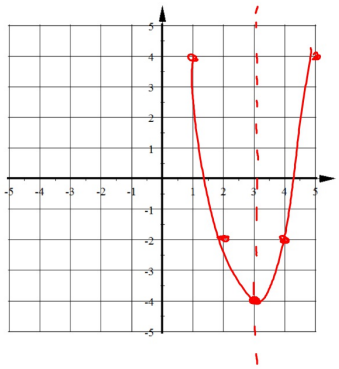
$y = 2x^2 - 12x + 14$

y-int = 14

LOS: $x = \frac{12}{2(2)} = 3$

$(3, -4)$

x	y
2	-2
1	4



Graph this quadratic.

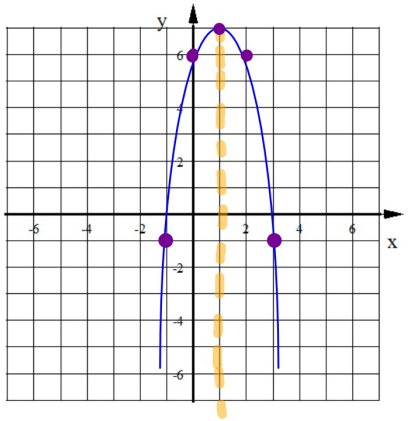
$y = -2x^2 + 4x + 5$

y-int = 5

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

Vertex $(1, 7)$ $-2(1)^2 + 4(1) + 5$

x	y
3	-1



Graph

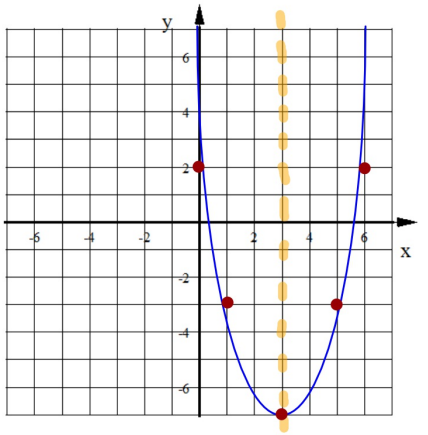
$y = x^2 - 6x + 2$

y-int = +2

LOS: $x = \frac{6}{2(1)} = 3$

Vertex: $(3, -7)$ $(3)^2 - 6(3) + 2$

x	y
1	-3



Graph $y = 3x^2 - 7$

$y = ax^2 + c$

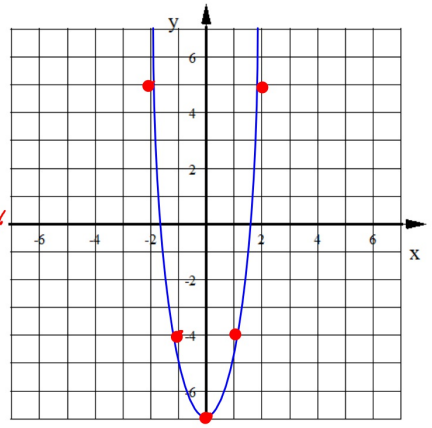
when b=0:

LOS is always $x = 0$

Vertex $(0, -7)$

This is the one case where the y-int and the vertex are the same point.

x	y
1	-4
2	5



Another way to graph a parabola:

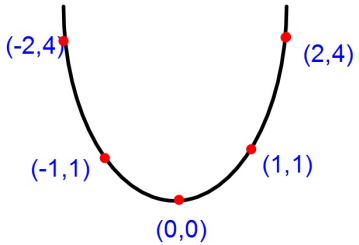
$y = ax^2 + bx + c$

Step 1: Find the Vertex

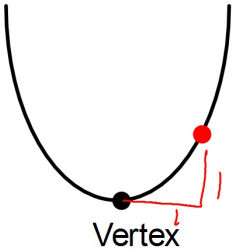
Step 2: Use the Vertical Stretch or Shrink Factor to find the remaining points.

Parent Quadratic Function: $y = x^2$

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



First "good" point after the vertex:



First "good" point

1 right and 1 up from the vertex

Second "good" point after the vertex: