One method for graphing Parabolas:

NOTES

$y = ax^2 + bx + c$

- Find the eq for the LOS and put it on the graph
- Find the Vertex and put it on the graph
- Plot the y-intercept, if it fits, and reflect over the LOS
- Find one other point and its reflection

Graph this quadratic.

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

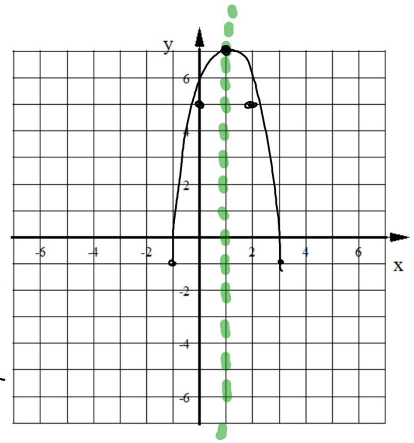
LOS: $x = \frac{-b}{2a} = \frac{-4}{-4} = 1$

Vertex: (1 , 7)

y-int: replace x with zero
y-int is always c
when eq is in Std Form

y-int = 5

X	Y
-1	-1



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

LOS

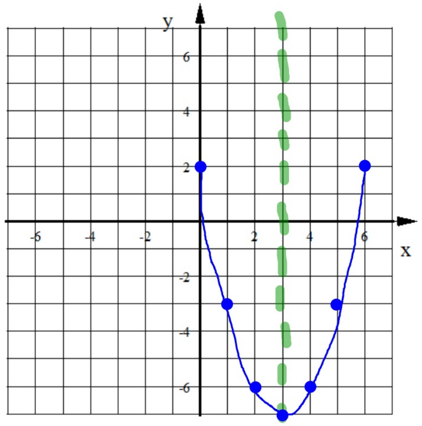
$x = \frac{6}{2(1)} = 3$

Vertex

(3, -7)

y-int: 2

x	y
2	-6
1	-3



Graph $y = 3x^2 - 7$

$y = ax^2 + c$

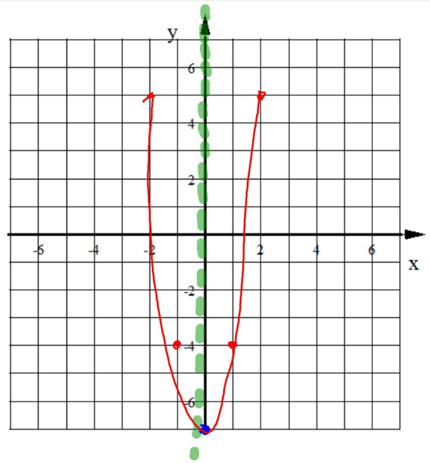
when b=0:

LOS is always $x = 0$

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

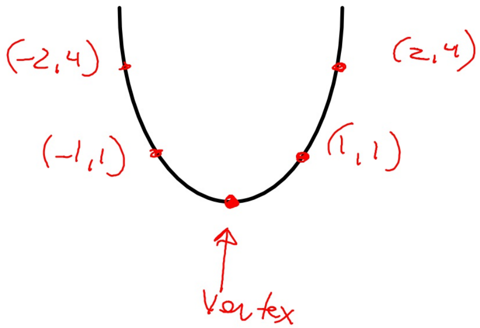
both the Vertex and the y-int are (0,-7)

X	Y
1	-4
2	5



Parent Quadratic Function: $y = x^2$

x	y
0	0
1	1
2	4



Another way to graph a parabola:

Step 1: Find the Vertex

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

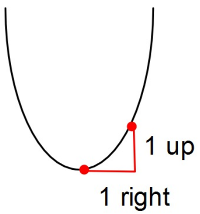
$y = ax^2 + bx + c$

a > 1 gives us a Vertical Stretch Factor (graph is taller than the parent function)

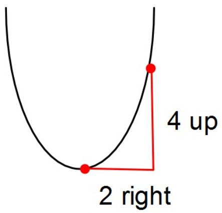
a < 1 gives us a Vertical Shrink Factor (graph is shorter than the parent function)

a = 1 means the graph is exactly the same height as the parent function

First good point of the parent function $y = x^2$



Second good point of the parent function $y = x^2$



You can use these points along with the vertical stretch factor from the equation to find the first two points from the Vertex then reflect them to finish finding the five points asked for.

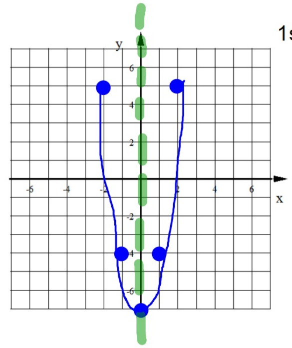
Graph $y = 3x^2 - 7$

Opens: up

LOS: $x = \frac{0}{2(3)} = 0$

Vertex: $(0,-7)$

y-int: $= -7$



1st good point:

1 x 3 = 3

1

2nd good point:

4 x 3 = 12

2

Vertical Stretch Factor: = 3

this means it opens up and is three times taller.