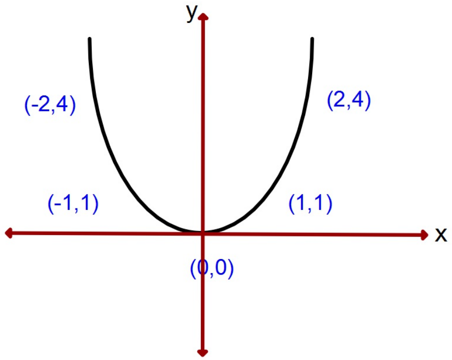
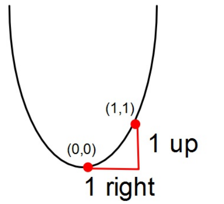
Parent Quadratic Function:

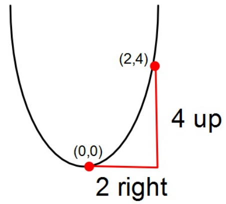
$y = x^2$



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/shrink factor from the equation to find the first two points from the Vertex then reflect them to finish finding the five points asked for.

Another way to graph a parabola:

Step 1: Find the LOS and Vertex

Step 2: Use the y-intercept and/or the Vertical Stretch or Shrink Factor to find the remaining points.

$y = ax^2 + bx + c$

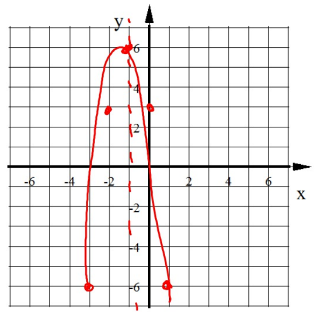
a > 1 gives us a Vertical Stretch Factor (graph is taller than the parent function)

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

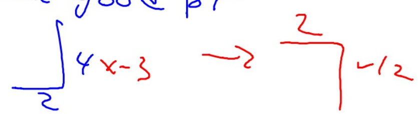
1. $y = -3x^2 - 6x + 3$

Vertex: (-1,6)



1st good pt

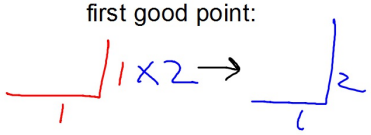
2nd good pt



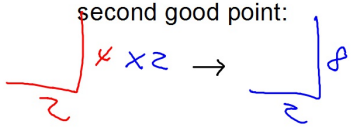
2. $y = 2x^2 - 16x + 29$

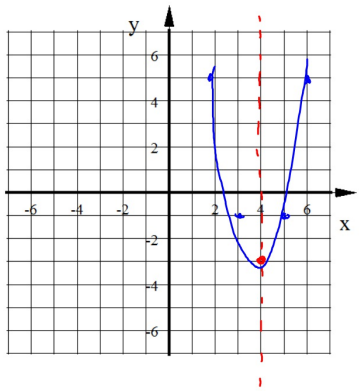
Vertex: (4,-3)

first good point:



second good point:



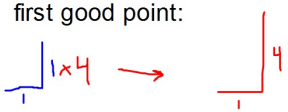


Graph: $y = 4x^2 - 24x + 29$

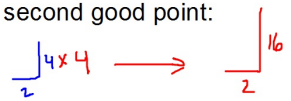
LOS $x = \frac{24}{8} = 3$

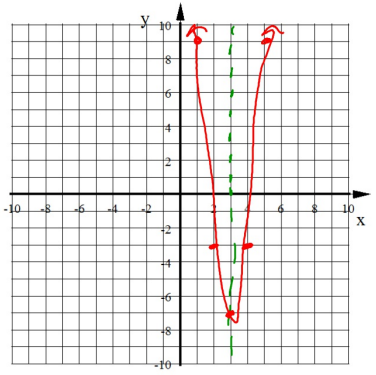
Vertex: (3, -7)

first good point:

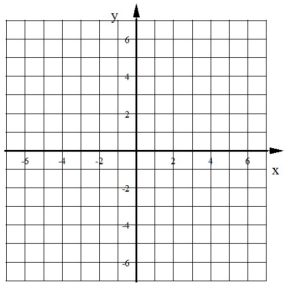


second good point:





Graph: $y = -x^2 + 4x - 2$



Remember, the vertex is either the maximum or the minimum of a quadratic function.

The max/min value of a quadratic function is.....the y-coordinate of the vertex

When a max/min of a quadratic occurs is.....the x-coordinate of the vertex

A company makes syringes. The following equation models their Profit as a function of the number of syringes made per hour.

$$P(s) = -0.45s^2 + 360s - 1250$$

LOS $s = \frac{-360}{2(-.45)}$

Vertex $(400, 70750)$ (s, P)

1. Find the number of syringes that should be made per hour in order to maximize the company's Profit.

400

2. What is the maximum Profit?

$70,750

A company needs to minimize their costs. The equation below gives their weekly costs (C) as a function of the number of hours each employee works (h).

$$C(h) = 6.5h^2 - 455h + 8760$$

Vertex (h, C)

Find the minimum costs the company can incur and how many hours each employee should work to reach this minimum.

LOS: $h = \frac{455}{2(6.5)}$

$h = 35$

Vertex: (35, 797.5)

Min costs = $797.50

hours = 35 hrs