

Graphing a parabola without a graphing calculator?

President Obama was asked to graph $y = x^2 - 2x - 8$



Below are some notes from his lesson to this class:

1st find the y-intercept: This is the point where the graph crosses the y-axis and x-value is zero; it can be found by substituting zero for x into the equation,
 $y = (0)^2 - 2(0) - 8 = -8$. So the y-intercept is $(0, -8)$.

2nd find the x-intercept(s): This will be where the graph crosses the x-axis and the y-value is zero, (a parabola can cross the x-axis either two times, one time or not at all). It can sometimes be easier to first write the equation in factored form, $y = (x - 4)(x + 2)$. Now use the zero-product property, (if $ab = 0$, then either $a = 0$ and/or $b = 0$).

$$y = (x - 4)(x + 2)$$

Thus we would have $0 = (x - 4)(x + 2)$ so there are two x-intercepts here, and they are

$$\rightarrow x = 4 \rightarrow x = -2$$

$(4, 0)$ and $(-2, 0)$.

3rd find the line of symmetry (L.O.S.): To find this line you remember that it is in the middle of the x-intercepts. What is in the middle of 4 and -2? So the equation for this line is $x = 1$.

4th find the vertex (A.K.A. the maximum or minimum point): The L.O.S. runs through the vertex, and thus the x-coordinate must have the same value as the L.O.S. does, in this case that value is 1. Now you find the y-value for this point (1, y - value?). This can be found by substituting the x-value of the L.O.S. into the equation. Note that every point on

$$y = (x - 4)(x + 2)$$

$$y = (1 - 4)(1 + 2)$$

the graph is also a solution to the equation.

$$y = (-3)(3)$$

$$y = -9$$

The vertex point is $(1, -9)$.

5th find two random points to shape out the parabola:

x	-3	3
y	7	-5

6th plot the points and create the parabola on the coordinate plane: Now be proud of your work knowing that you did not give up when things got hard! Because at the end of the

