

STATION #1

Graphing a quadratic equation using a 5-point table:

EXAMPLE:

$$y = x^2 - 2x - 8$$

1. find the vertex: $-\frac{b}{2a}$

$$\frac{-(-2)}{2 \cdot 1} = 1$$

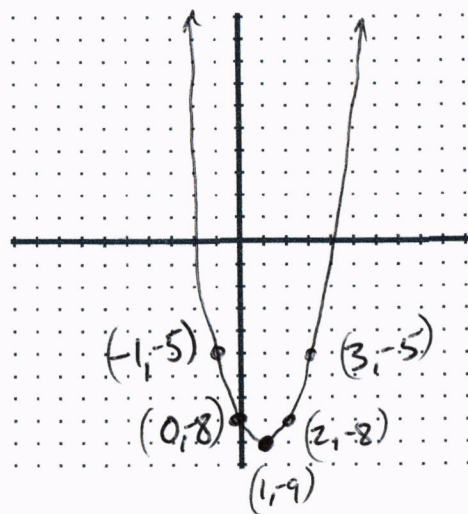
2. count by 1's to fill in the table.

3. plug each number into the equation to find the y-value

4. plot the points

5. draw a parabola

x	y
3	-5
2	-8
1	-9
0	-8
-1	-5



PROBLEM:

$$y = x^2 + 2x - 3$$

STATION #2

Sketching a graph in **STANDARD FORM**, with x-intercepts, vertex, and line of symmetry

EXAMPLE:

$$y = x^2 - 2x - 35$$

1. factor the equation
(what multiplies to -35
and adds to -2?)

$$y = (x-7)(x+5)$$

2. set each factor equal
to zero and solve for
 x .

$$x-7=0$$

$$x=7$$



$$x+5=0$$

$$x=-5$$



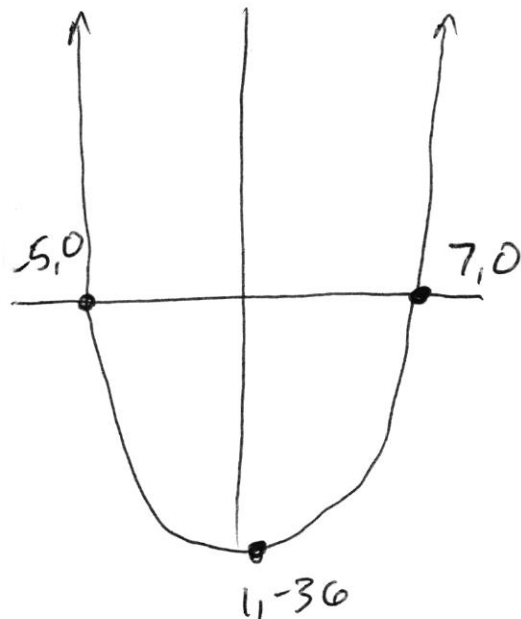
x-intercepts.

3. Use $-\frac{b}{2a}$ to find
the x -coordinate
of the vertex:

$$-\frac{-2}{2-1} = 1$$

4. plug that into the
equation to find
the y -coordinate

$$y = 1^2 - 2(1) - 35 \rightarrow -36$$



PROBLEM:

$$y = x^2 + 4x - 12$$

STATION #3

Sketching a graph in **FACTORED FORM**, with x-intercepts, vertex, and line of symmetry

EXAMPLE:

$$y = -2(x - 8)(x - 2)$$

1. Set each factor equal to zero & solve for x .

$$\begin{array}{lcl} (x-8)=0 & (x-2)=0 & \\ x=8 & x=2 & \leftarrow x\text{-intercepts.} \end{array}$$

2. The x -coordinate of the vertex is halfway between them

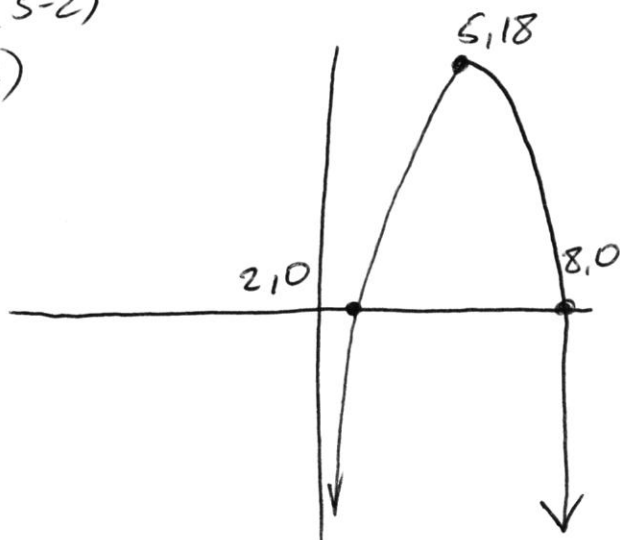
$$\frac{8+2}{2} \rightarrow 5$$

3. plug the x -coordinate into the equation to find the y -coordinate

$$-2(5-8)(5-2)$$

$$-2(-3)(3)$$

$$18$$



PROBLEM:

$$y = -3(x + 4)(x + 6)$$

STATION #4

Sketching a graph in **VERTEX FORM**, with x-intercepts, vertex, and line of symmetry

EXAMPLE:

$$y = -3(x + 2)^2 + 27$$

$$y = a(x - h)^2 + k$$

1. Ident. fy (h, k) . That is the vertex
remember h always changes signs.

vertex: $(-2, 27)$

2. multiply it out to change it to standard form:

$$-3(x+2)^2 + 27$$

$$-3(x^2 + 4x + 4) + 27$$

$$-3x^2 - 12x - 12 + 27$$

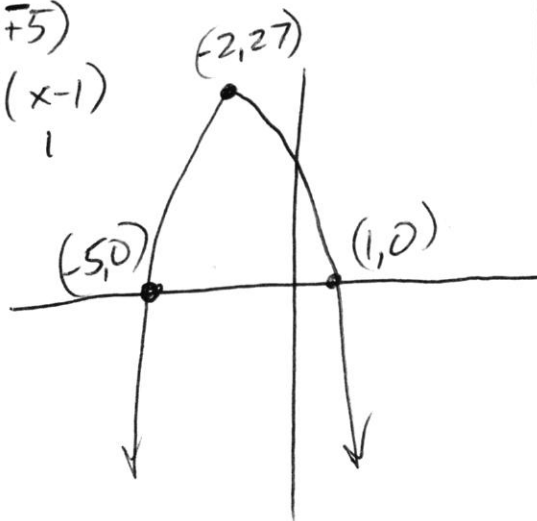
$$-3x^2 - 12x + 15$$

3. Factor

$$-3(x^2 + 4x + 5)$$

$$-3(x + 5)(x - 1)$$

x-intercepts: $\rightarrow -5$ 1



PROBLEM:

$$y = +2(x - 1)^2 - 50$$

STATION #5

Estimating key points with your calculator. Use your calculator to estimate the vertex, and x-intercepts:

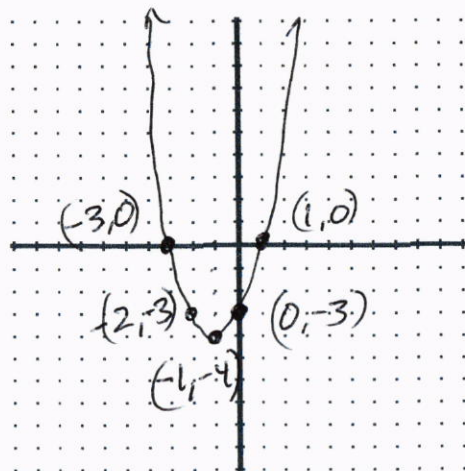
$$y = x^2 + 3x - 7$$

1. Graph this equation in your calculator.
2. IF the graph is not visible in the window, adjust the window so you can see the vertex and x-intercepts:
Click MENU
4: WINDOW/ZOOM
1: WINDOW SETTINGS
Make the y-minimum a larger number so you can see the vertex
3. Find the vertex:
Click MENU
6: ANALYZE GRAPH
2: MINIMUM (or maximum if the graph opens downward)
Click once to the left of the vertex, and once to the right of the vertex.
4. Find the intercepts:
Click MENU
6: ANALYZE GRAPH
1: ZERO
Click once to the left of the intercept you want and once to the right.

#1

1	0
0	-3
-1	-4
-2	-3
-3	0

$$-\frac{2}{2 \cdot 1} = -1$$

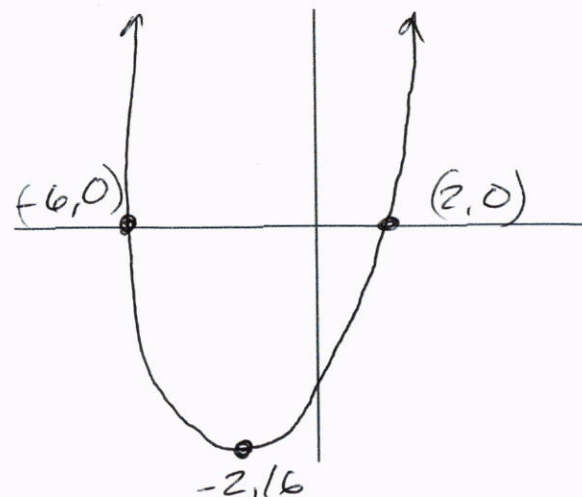


#2 $x^2 + 4x - 12$

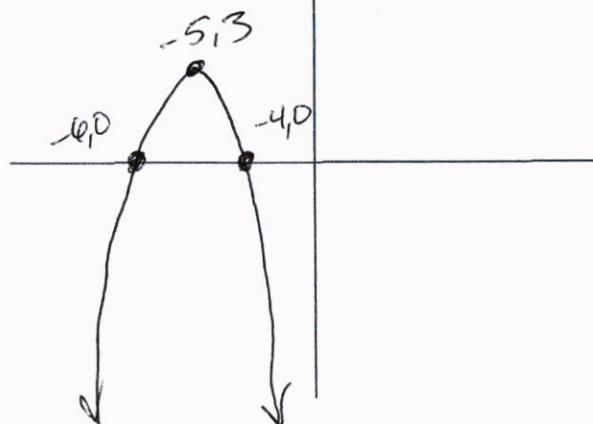
$$(x+6)(x-2)$$

$$-6 \quad 2$$

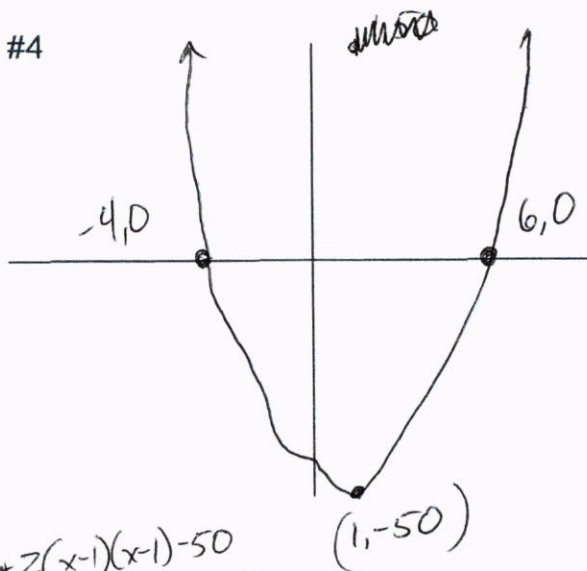
$$-\frac{4}{2 \cdot 1} = -2$$



#3 $-3(x+4)(x+6)$
-4 -6



#4



$$+2(x-1)(x-1)-50$$

$$2(x^2-2x+1)-50$$

$$2x^2-4x+2-50$$

$$2x^2-4x-48$$

$$2(x^2-2x-24)$$

$$2(x-6)(x+4)$$

#5

