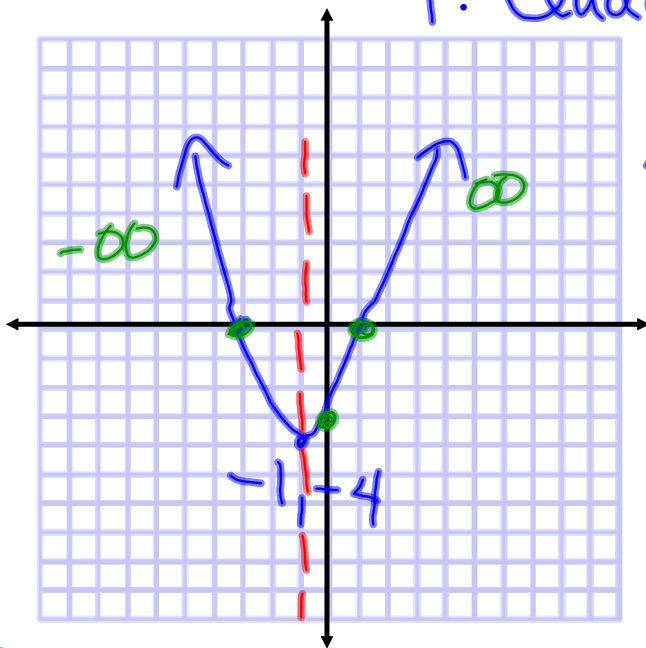


# 1. Quadratic



A. X-values  
 $\mathbb{R}$  or  $(-\infty, \infty)$

B.  $(-4, \infty)$   
 $y \geq -4$

C.  $(-1, -4)$

D.  $x = -1$

E.  $(-3, 0)$  &  $(1, 0)$

F.  $(0, -3)$

H.  $(-\infty, -1)$

G.  $(-1, \infty)$

I. min

J.  $(-1, -4)$

# Standard form

$$y = ax^2 + bx + c$$

1. Label  $a = \underline{\quad}$   
 $b = \underline{\quad}$   
 $c = \underline{\quad}$
2. Find the vertex  $(x, y)$ 
  - Find  $x$  by using  $\frac{-b}{2a}$
  - Find  $y$  by plugging in  $x$  to the equation
3. Plot vertex
4. Pick a pt & find  $y$  (Mini T-table)

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

$$a = 3 \quad b = 6 \quad c = 1$$

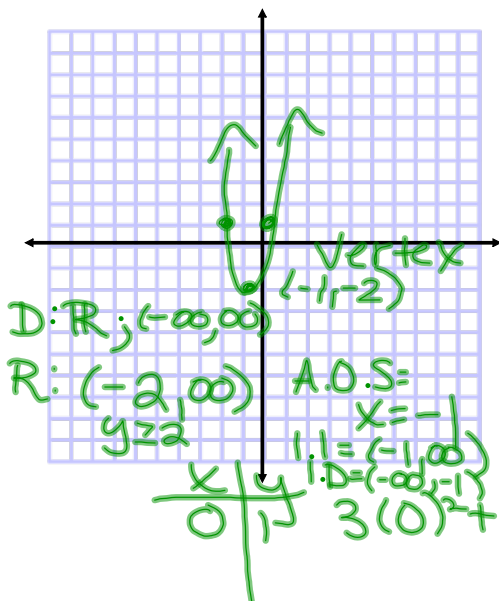
$$\frac{-b}{2a} = x \quad \begin{matrix} (-1 & -2 \\ x & y \end{matrix}$$

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

$$y = 3(-1)^2 + 6(-1) + 1$$

$$3 \cdot 1 - 6 + 1 + 1$$

$$3 - 6 + 1 = -2$$



$$y = \frac{1}{2}x^2 + 2x + 4$$

$$a = \frac{1}{2} \quad b = 2 \quad c = 4$$

$$v. \quad x = \frac{-b}{2a} = \frac{-2}{2(\frac{1}{2})} = -2$$

$$x = -2$$

$$y = \frac{1}{2}(-2)^2 + 2(-2) + 4$$

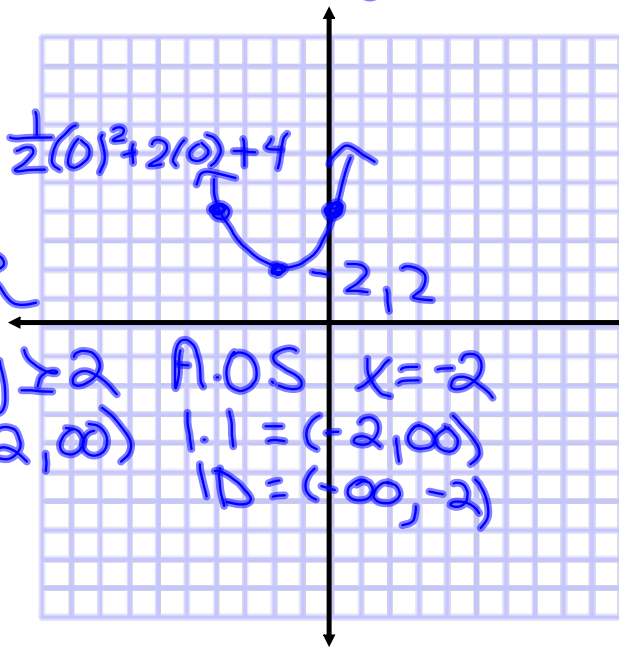
$$\text{Vertex } y = 2 \\ (-2, 2)$$

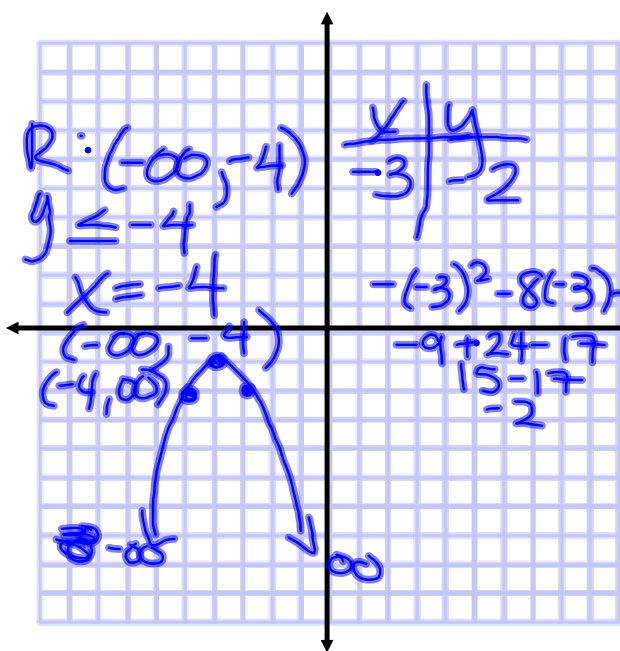
x	y
0	4

$$\frac{1}{2}(0)^2 + 2(0) + 4$$

$$D: \mathbb{R}$$

$$R: y \geq 2 \quad \text{A.O.S } x = -2 \\ (2, \infty) \quad \text{I.I } = (-2, \infty) \\ \text{ID} = (-\infty, -2)$$





$$-x^2 - 8x - 17$$

$$a = -1 \quad b = -8 \quad c = -17$$

$$x = \frac{-b}{2a} = \frac{8}{2(-1)} = \frac{8}{-2} = -4$$

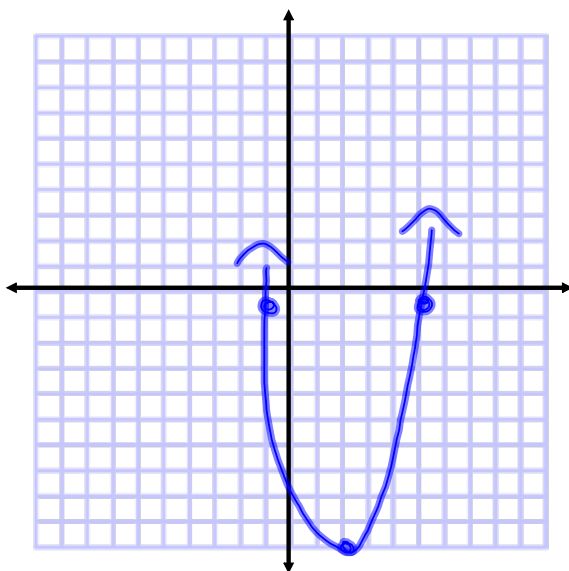
$$y = -(-4)^2 - 8(-4) - 17$$

$$-16 + 32 - 17$$

$$16 - 17 = -1$$

$$(-4, -1)$$

- ① Plot  $h, k$
- ② Pick 1 pt to the left + right on the x
- ③ Find  $y$
- ④ Graph (\*Symmetric)



$$y = (x-5)(x+1)$$

$$a=1 \quad b=5 \quad c=-1$$

$$x = \frac{b+c}{2} = \frac{5+(-1)}{2} = 2$$

$$y = (2-5)(2+1) \\ (-3)(3) = -9$$

$b+c$  are  
intercepts

Intercept  
form

$$y = a(x-b)(x-c)$$

vertex

$$x = \frac{b+c}{2}$$

To find y plug in  
the x