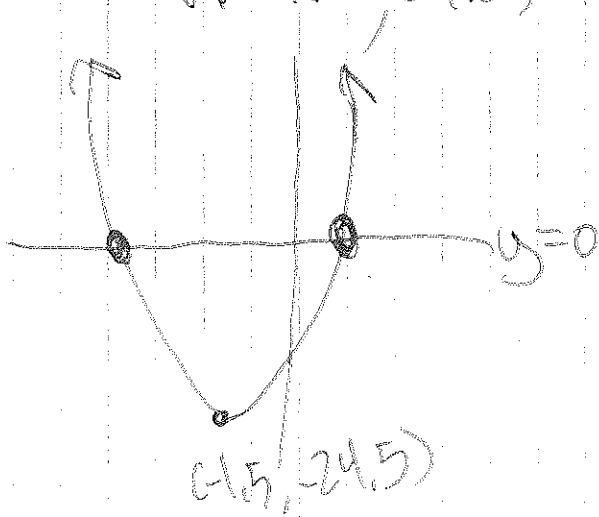


Quadratic/Parabola:

V: (-1.5, -24.5)



$$2(x+1.5)^2 - 24.5 = 0$$

+24.5 +24.5

$$\frac{2(x+1.5)^2}{2} = \frac{24.5}{2}$$

$$(x+1.5)^2 = 12.25$$

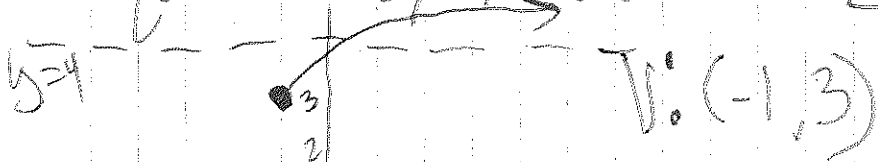
$$x+1.5 = 3.5$$

$$x = 2$$

$$x+1.5 = -3.5$$

$$x = -5$$

Square Root/Radical



$$2\sqrt{x+1} + 3 = 4$$

-3 -3

$$\frac{2\sqrt{x+1}}{2} = \frac{1}{2}$$

$$(\sqrt{x+1})^2 = \left(\frac{1}{2}\right)^2$$

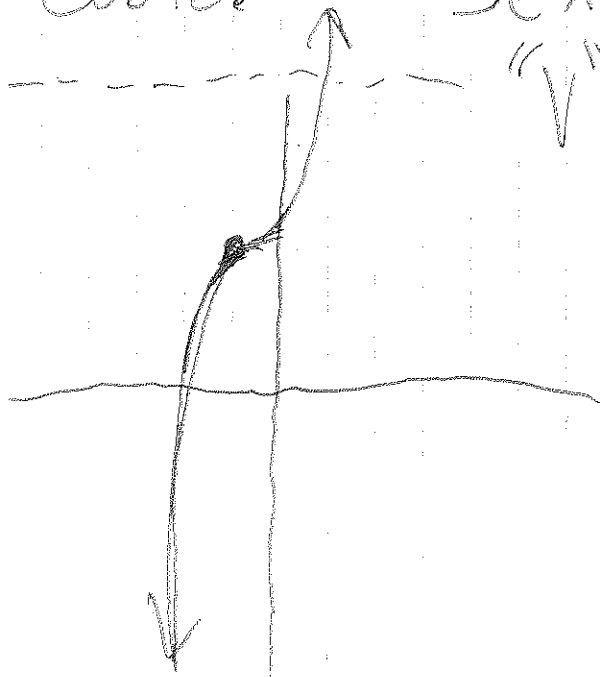
$$x+1 = \frac{1}{4}$$

$$x = -3/4$$

Cubic:

$$3(x+1)^3 + 3 = 27$$

$$"V" = (-1, 3)$$



$$\frac{3(x+1)^3}{3} = \frac{24}{3}$$

$$(x+1)^3 = 8$$

$$x+1 = 2$$

$$x = 1$$

Rational:

Hyperbola

$$\frac{3}{x+2} - 2 = 1$$

$$"V" = (-2, -2)$$

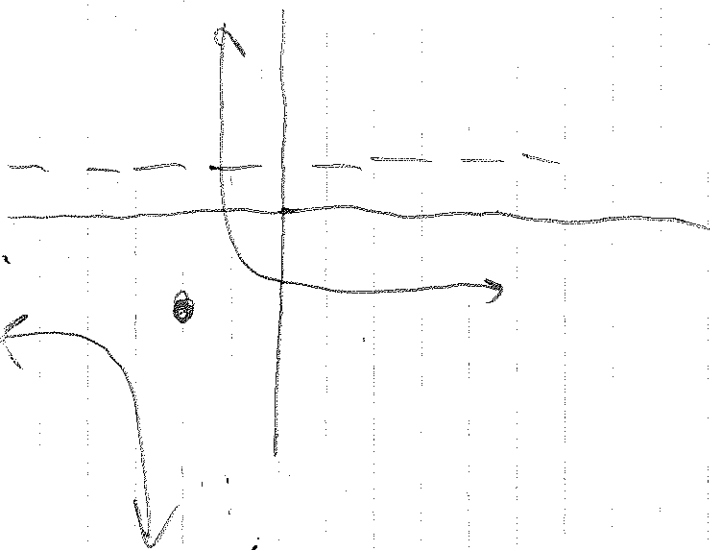
$$\cancel{x+2} \cdot \frac{3}{\cancel{x+2}} = 3 \cdot (x+2)$$

$$3 = 3x + 6$$

$$-6 \quad -6$$

$$\frac{-3}{3} = \frac{3x}{3}$$

$$-1 = x$$

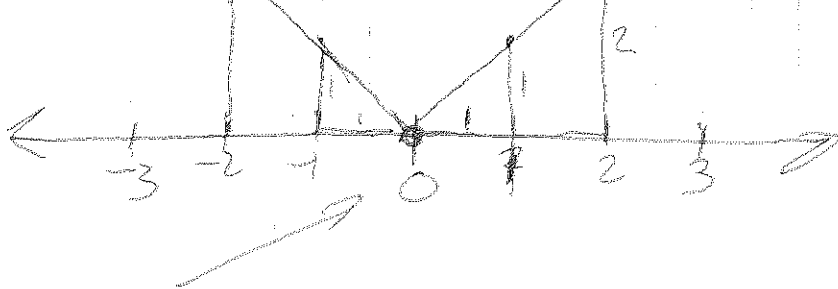


Absolute Value: $|x|$ means "distance from zero".

So $|5| = 5$ & $|-5| = 5$, because

5 & -5 are 5 steps away from zero.

To make the graph, think of the number line.



Zero is the middle of the number line.

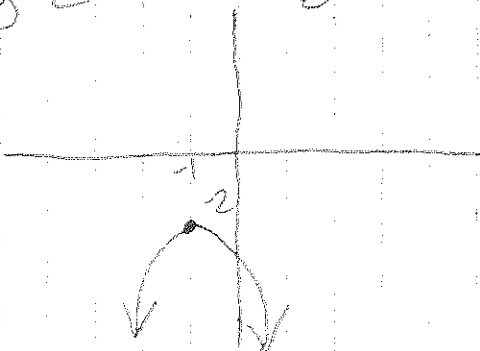
Think about symmetry!

Just like parabolas have a vertex that is on the axis of symmetry, so do absolute values.

$$y = -2(x+1) - 3$$

Points down stretched by 2

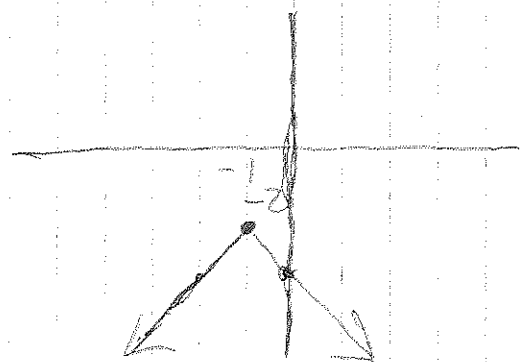
$x = -1$ makes this zero zero = middle



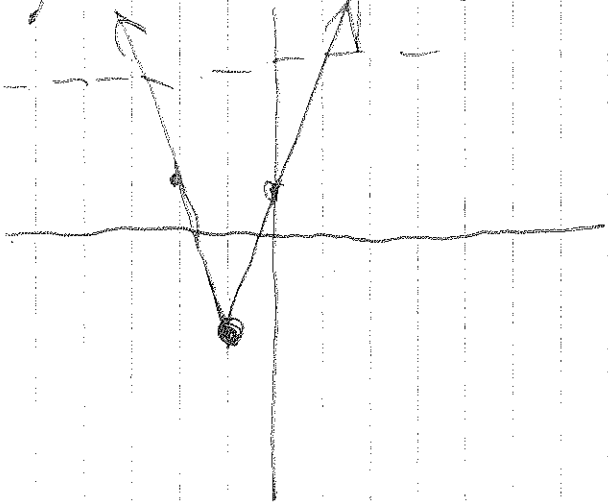
$$y = -2|x+1| + 3$$

points down, stretched by 2

$x = -1$ makes this zero zero = middle



Absolute Value:



$$3|x+1| - 2 = 4$$
$$+2 \quad +2$$

$$\frac{3|x+1|}{3} = \frac{6}{3}$$

$$|x+1| = 2$$

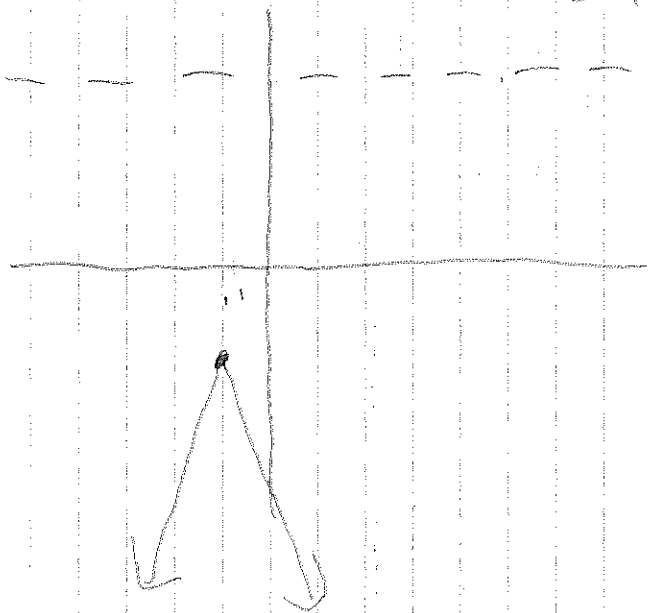
$$x+1 = 2$$

$$x = 1$$

$$x+1 = -2$$

$$x = -3$$

$$-3|x+1| - 2 = 4$$



No solution.

Always visualize
the graphs first.