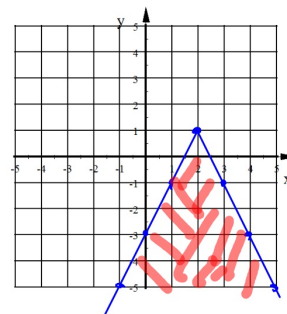**Graph this inequality:**

$$y \geq \frac{3x - 4}{1}$$

- Plot points for the line
- Connect points with a "solid" line because of the "or equal to" part of the inequality.
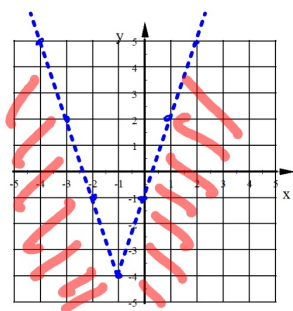- Shade the region above the line because of the "greater than" part of the inequality.

Graph this function:

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

Graph this inequality:
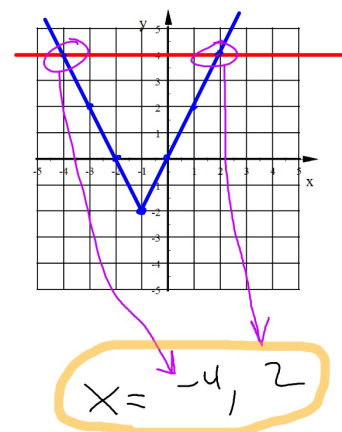
$$y \leq -2|x - 2| + 1$$

Graph the same V-shape then shade the region below the graph (y is "less").

Graph this inequality:

$$y < 3|x + 1| - 4$$

Graph the V-shape, connected with dashes, then shade the region below (y is "less than")

1. Graph $y = 2|x + 1| - 2$

2. Use this graph to solve this equation:
$$2|x + 1| - 2 = 4$$

y_1 V-shape y_2 Horizontal line

If you solve an equation by graphing you can graph the two sides of the equation separately. The solution will be the points of intersection of the two graphs....that is where they are "equal".

$$x = -4, \ 2$$

Solve: $2|x + 1| - 2 = 4$

First, isolate the absolute value portion of the equation.

$$+2 \qquad +2$$
$$\frac{2|x+1|}{2} = \frac{6}{2} \Bigg\} \longrightarrow |x+1| = 3$$

Definition	Algebraic Definition of Absolute Value
• If $x \geq 0$, then $|x| = x$.	• If $x < 0$, then $|x| = -x$.

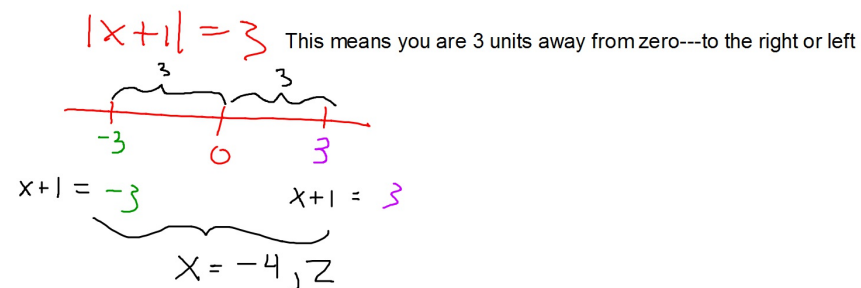This says that the absolute value of anything is either itself or its opposite

$$x + 1 = 3 \qquad\qquad x + 1 = -3$$
$$-1 \quad -1 \qquad\qquad -1 \quad -1$$
$$\boxed{x = 2 \qquad\qquad x = -4}$$

Solve: $2|x + 1| - 2 = 4$

After you isolate the absolute value you can apply the definition of absolute value:

$$|x+1| = 3$$

Absolute Value --- Distance from zero on a number line.

$$|x+1| = 3$$ This means you are 3 units away from zero---to the right or left

$$x + 1 = -3 \qquad\qquad x+1 = 3$$
$$x = -4, 2$$

Solve this equation:

$$5|2x - 3| + 7 = 31$$
$$-7 \qquad -7$$
$$\frac{5|2x-3|}{5} = \frac{24}{5}$$
$$|2x - 3| = 4.8$$

4.8 units to the left of zero

4.8 units to the right of zero

$$2x - 3 = -4.8 \qquad\qquad 2x - 3 = 4.8$$
$$+3 \quad +3 \qquad\qquad\quad +3 \quad +3$$
$$\frac{2x}{2} = \frac{-1.8}{2} \qquad\qquad \frac{2x}{2} = \frac{7.8}{2}$$
$$\boxed{x = -0.9, 3.9}$$