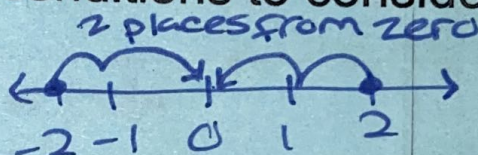


# SOLVING ABSOLUTE VALUE EQUATIONS

Absolute Value means "distance from zero". When you solve an equation with absolute value, there are two conditions to consider.

$$|x| = 2$$



Steps to Solving:

$$x = -2 \text{ and } 2$$

1) Isolate the absolute value expression.  
(the part inside the  $| \quad |$ )

2) Set the absolute value expression equal to the positive and negative value of the number shown.

Set up 2 equations.

3) Solve each equation

$$|?| = +\#$$

$$|?| = -\#$$

You almost always  
have 2 answers!

$$|x| = 6$$

$$\begin{array}{l} + \\ x = 6 \end{array}$$

$$\begin{array}{l} - \\ x = -6 \end{array}$$

$$|4x| = 12$$

$$\begin{array}{l} + \\ 4x = 12 \\ \frac{4}{4} \quad \frac{4}{4} \\ x = 3 \end{array}$$

$$\begin{array}{l} - \\ 4x = -12 \\ \frac{4}{4} \quad \frac{4}{4} \\ x = -3 \end{array}$$

$x = 3$  and  $x = -3$

$$|x + 2| = 8$$

$$\begin{array}{l} + \\ x + 2 = 8 \\ -2 \quad -2 \\ x = 6 \end{array}$$

$$\begin{array}{l} - \\ x + 2 = -8 \\ -2 \quad -2 \\ x = -10 \end{array}$$

$x = 6$  and  $x = -10$

Isolate abs. value 1st!

$$|x - 7| + 2 = 10$$

$$\begin{array}{r} -2 \quad -2 \\ \hline |x - 7| = 8 \end{array}$$

$$\begin{array}{l} + \\ x - 7 = 8 \\ +7 \quad +7 \\ x = 15 \end{array}$$

$$\begin{array}{l} - \\ x - 7 = -8 \\ +7 \quad +7 \\ x = -1 \end{array}$$

$$2|x - 3| = 18$$

$$\begin{array}{r} \frac{2}{2} \quad \frac{2}{2} \\ \hline |x - 3| = 9 \end{array}$$

$$\begin{array}{l} x - 3 = 9 \\ +3 \quad +3 \\ x = 12 \end{array}$$

$$\begin{array}{l} x - 3 = -9 \\ +3 \quad +3 \\ x = -6 \end{array}$$

★ absolute value  $\neq$  -#

ex:  $|x + 2| = -4$  No Solution

$$\begin{array}{l} x + 2 = -4 \\ x = -6 \end{array}$$

$$\begin{array}{l} x + 2 = 4 \\ x = 2 \end{array}$$