

**Steps for Solving Linear Absolute Value Equations:** *i.e.*  $|ax + b| = c$

1. Isolate the absolute value.
2. Identify what the isolated absolute value is set equal to...
  - a. If the absolute value is set **equal to zero**, remove absolute value symbols & solve the equation to get **one solution**.
  - b. If the absolute value is set **equal to a negative** number, there is **no solution**.
  - c. If the absolute value is set **equal to a positive** number, set the argument (*expression within the absolute value*) equal to the number **and** set it equal to the opposite of the number, using an 'or' statement in between the two equations. Then solve each equation separately to get **two solutions**.

Examples:

a.  $|3x + 12| + 7 = 7$

$$|3x + 12| = 0$$

Because this equals **0**, there is **ONE** solution.

$$3x + 12 = 0$$

$$3x = -12$$

$$x = -4$$

b.  $|3x - 7| + 7 = 2$

$$|3x - 7| = -5$$

Because this equals a **negative** number, there is **NO** solution.

**No Solution**

c.  $|3x - 7| + 7 = 9$

$$|3x - 7| = 2$$

Because this equals a **positive** number there are **TWO** sltns.

$$3x - 7 = 2$$

$$3x = 9$$

$$x = 3$$

or  $3x - 7 = -2$

or  $3x = 5$

or  $x = \frac{5}{3}$

d.  $|x + 5| = |2x - 1| \rightarrow$

$$x + 5 = +(2x - 1)$$

$$x = 6$$

Set up two Equations

or  $x + 5 = -(2x - 1)$

or  $x + 5 = -2x + 1 \rightarrow 3x = -4 \rightarrow x = -\frac{4}{3}$