

# Absolute Value Equations

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Absolute value of a real number is the \_\_\_\_\_ from zero on a number line.  
Distance is always positive.

$$|x| = 2$$

$$|x| = -3$$

$$|x| = 0$$

Process:

1. Isolate the absolute value expression.  $|\text{expression}| = \text{number}$
2. Determine the type of number the absolute value expression is equal to
  - a. If it is equal to a **NEGATIVE NUMBER** the answer is **NO SOLUTION**.
  - b. If it is equal to a **POSITIVE NUMBER** you will split into 2 equations (without absolute value bars)—(2 solutions)  
 $\text{expression} = \text{number}$  or  $\text{expression} = -(\text{number})$
  - c. If it is equal to **ZERO** rewrite the equation without absolute value bars and solve for the variable. (one solution)

Example 1:  $|2x + 5| = 13$

Example 2:  $|3x - 4| - 3 = 11$

Example 3:  $2|2x - 5| + 5 = 11$

Example 4:  $|2x + 1| + 4 = 4$

Example 5:  $2|2x - 5| + 9 = 9$

Example 6:  $4|x - 1| + 7 = 3$

Example 7:  $5 - |2x - 3| = 7$