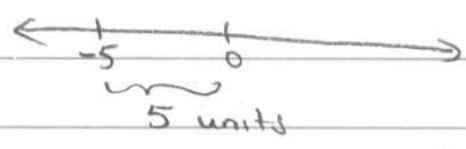


# Lesson 4: Solving Absolute Value Equations

- What is absolute value?

It is the distance on the number line from 0 to a number.

ex:  $|-5| = 5$



- can abs value ever be negative? no (distance)
- can abs value ever be 0? yes, for 0
- can two numbers have the same abs value?
- can more than two #s have the same abs val?

- Equations:

- Given  $|★| = 5$ , we know that  $★$  can be 5 (since  $|5| = 5$ ) and  $★$  can be -5 (since  $|-5| = 5$ ).

Thus  $★ = 5$  or  $★ = -5$ . (recall, the variable is the set of all possible solutions)

ex:  $|x+3| = 2$

$$\begin{array}{r} \text{so } x+3 = 2 \quad \text{or} \quad x+3 = -2 \\ \quad \underline{-3} \quad \underline{-3} \qquad \quad \underline{-3} \quad \underline{-3} \end{array}$$

$x = -1$

$x = -5$

← both sols work



13

ex:  $|2x + 3| - 1 = 1$

want abs value by itself

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

$$\underline{+1} \quad \underline{+1}$$

$$|2x + 3| = 2$$

$$2x + 3 = 2$$

$$\underline{-3} \quad \underline{-3}$$

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

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

$$2x + 3 = -2$$

$$\underline{-3} \quad \underline{-3}$$

$$\frac{2x}{2} = \frac{-5}{2}$$

$$x = -\frac{5}{2}$$

ex:  $|3x + 2| = -4$

no answer, watch out!