

Jan. 31, 2018

Sect. 3-5

Solving Absolute Value Equations

Solve $|x| = 5$

What #(s) are 5 units away from 0?

5 and -5

$$\text{Solve } |x-2| = 17$$

Case I

$$x-2 = 17$$

$$x = 19$$

or

Case II

$$x-2 = -17$$

$$x = -15$$

$$\{-15, 19\}$$

$$\text{Solve: } |2x + 1| = 9$$

$$2x + 1 = 9$$

$$2x = 8$$

$$x = 4$$

$$2x + 1 = -9$$

$$2x = -10$$

$$x = -5$$

or

$$\{4, -5\}$$

$$\text{Solve : } |3x - 2| = 12$$

$$3x - 2 = 12$$

$$3x = 14$$

$$x = \frac{14}{3}$$

$$3x - 2 = -12$$

$$3x = -10$$

$$x = -\frac{10}{3}$$

or

$$\left\{ -\frac{10}{3}, \frac{14}{3} \right\}$$

$$\frac{2|x+1|}{2} = \frac{6}{2} \Rightarrow |x+1| = 3$$

Finish...

$$\begin{array}{r} |x-3| + 4 = 10 \\ -4 \quad -4 \\ \hline |x-3| = 6 \end{array}$$

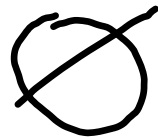
Finish...

Special Case: *Be Careful!*

$$|x+2| = -5$$

Can't do it!

No Solution



$$\frac{-2|x+1|}{-2} = \frac{-6}{-2}$$

$$|x+1| = 3$$

$$x+1=3 \quad \text{or} \quad x+1=-3$$

$$x=2 \quad \text{or} \quad x=-4$$

$$\{-4, 2\}$$