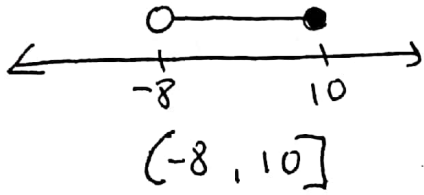


Objective: To solve absolute value inequalities

Warm-up: solve, graph, and write in interval notation

$$1.) -3 < x + 5 \leq 15$$

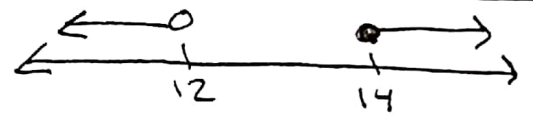
$$\begin{array}{ccc} -5 & & -5 \\ \hline -8 < x \leq 10 \end{array}$$



$$2.) \frac{4}{3}x < \frac{9}{1} \cdot \frac{4}{3} \text{ or } \frac{x}{2} \geq 7 \cdot 2$$

$$x < \frac{36}{3}$$

$$x < 12 \text{ or } x \geq 14$$



$$(-\infty, 12) \cup [14, +\infty)$$

Statements

Answers

$$|x| = 2$$

$$x = 2 \quad x = -2$$

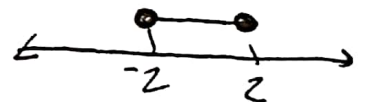
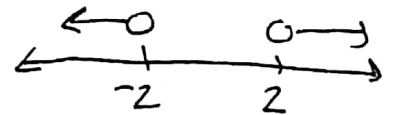
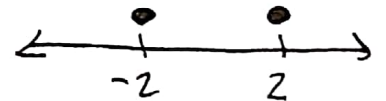
$$|x| > 2$$

$$x > 2 \text{ or } x < -2$$

$$|x| \leq 2$$

$$-2 \leq x \leq 2$$

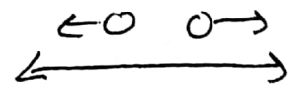
graph



symbols

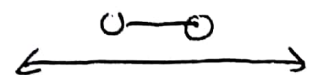
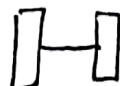
$$|x| >, \geq$$

"or"
Greater than
~~sandwich~~
Divorce



$$|x| <, \leq$$

"and"
Less than
sandwich



Steps: 1.) Isolate the absolute value by using opposite operations.

2.) Circle the inequality to see if its 'and' or 'or'.

$>, \geq$ 'or'
 $<, \leq$ 'and'

3.) Set up the compound inequality by "drop and opp" and solve.

Example 1

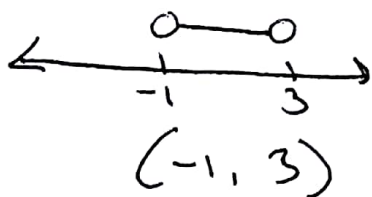
$$|x-1| + 4 < 6$$

$$\frac{-4 \quad -4}{|x-1| < 2}$$

'and' sandwich

$$-2 < x-1 < 2$$

$$\frac{+1 \quad +1 \quad +1}{-1 < x < 3}$$



Example 2

$$|x-1| + 4 \geq 6$$

$$\frac{-4 \quad -4}{|x-1| \geq 2}$$

'or'

$$x-1 \geq 2 \text{ or } x-1 \leq -2$$

$$\frac{+1 \quad +1 \quad +1 \quad +1}{x \geq 3 \text{ or } x \leq -1}$$



* inequality flips for the negative.

$$(-\infty, -1] \cup [3, \infty)$$

10/1

Homework : solving absolute value inequalities

1.) $3|x| < 24$

2.) $|x-3| - 1 \geq 4$

3.) $|x-6| + 3 \leq 4$

4.) $3|x+2| > 24$

5.) $4|x-9| - 12 < 20$

6.) $2|x-4| - 10 \geq 2$

7.) challenge : $-|x-1| + 4 \geq 2$