

* When you divide or multiply by a negative, you must flip the inequality symbol.

Solve Absolute Value Inequalities

GREATER THAN: $>$ OR \geq (shade on outside) LESS THAN: $<$ OR \leq (shade in middle)

* Isolate Absolute Value

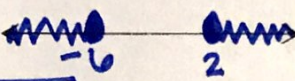
* Set up 2 inequalities (1st stays the same & 2nd flip the inequality symbol & change sign of #)

* Solve & graph on # line.

Write solution in interval notation.

Solve and graph. Write your answers in interval notation.

1) $|3x + 6| \geq 12$




$$3x + 6 \geq 12 \quad \text{OR} \quad 3x + 6 \leq -12$$

$$3x \geq 6 \qquad \qquad \qquad 3x \leq -18$$

$$x \geq 2 \qquad \qquad \qquad x \leq -6$$

$(-\infty, -6] \cup [2, \infty)$

2) $|2x - 3| > 7$



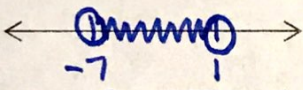
$$2x - 3 > 7 \quad \text{OR} \quad 2x - 3 < -7$$

$$2x > 10 \qquad \qquad \qquad 2x < -4$$

$$x > 5 \qquad \qquad \qquad x < -2$$

$(-\infty, -2) \cup (5, \infty)$

3) $3|2x + 6| - 9 < 15$



$$3|2x + 6| < 24$$

$$|2x + 6| < 8$$

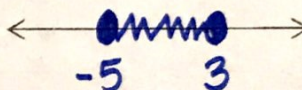
$$2x + 6 < 8 \quad \text{AND} \quad 2x + 6 > -8$$

$$2x < 2 \qquad \qquad \qquad 2x > -14$$

$$x < 1 \qquad \qquad \qquad x > -7$$

$(-7, 1)$

4) $-2|x + 1| + 5 \geq -3$



$$-2|x + 1| \geq -8$$

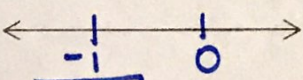
$$|x + 1| \leq 4$$

$$x + 1 \leq 4 \quad \text{AND} \quad x + 1 \geq -4$$

$$x \leq 3 \qquad \qquad \qquad x \geq -5$$

$[-5, 3]$

5) $|2x + 1| < -1$



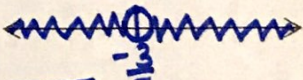
$$2x + 1 < -1 \quad \text{AND} \quad 2x + 1 > 1$$

$$2x < -2 \qquad \qquad \qquad 2x > 0$$

$$x < -1 \qquad \qquad \qquad x > 0$$

No Solution

6) $|5x + 3| > 0$



$$5x + 3 > 0 \quad \text{OR} \quad 5x + 3 < 0$$

$$5x > -3 \qquad \qquad \qquad 5x < -3$$

$$x > -\frac{3}{5} \qquad \qquad \qquad x < -\frac{3}{5}$$

$(-\infty, -\frac{3}{5}) \cup (-\frac{3}{5}, \infty)$