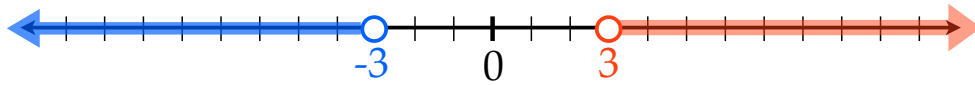Absolute Value Inequality

The distance from x to 0 is greater than 3.

$$|x| > 3$$

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

Compound Inequality with an OR

Absolute Value Inequality

The distance from x to 0 is less than 3.

$$|x| < 3$$

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

$$-3 \; < \; x \; < \; 3$$

Compound Inequality with an AND

Solving Absolute Value Inequalities

1. Isolate absolute value expression (left side)

2. Create compound inequality

$$|x| \leq a \qquad\qquad |x| \geq a$$

$$x \leq a \quad and \quad x \geq -a \qquad x \geq a \quad or \quad x \leq -a$$

"less than" ➡ *and*   *"greater than"* ➡ *or*

3. Solve and graph both inequalities

Solve the following absolute value inequalities:

"less than" ➡ *and*   *"greater than"* ➡ *or*

$$|2x| \geq 10 \qquad\qquad 5|x| < 20$$
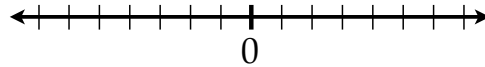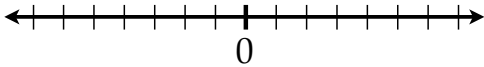
Solve the following absolute value inequalities:

    "less than"➡ *and*   *"greater than"*➡ *or*

$|2x - 5| \leq 7$

0
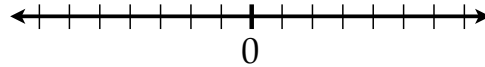
Solve the following absolute value inequalities:

    "less than"➡ *and*   *"greater than"*➡ *or*

$|3x + 12| > 6$

0
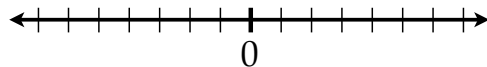
Solve the following absolute value inequalities:

"less than" ➡ *and*   *"greater than"* ➡ *or*

$$|2x + 1| < -10$$ $$|2x + 1| > -2$$

Solving Absolute Value Inequalities

1. Isolate absolute value expression (left side)

2. Create compound inequality

$$|x| \leq a$$ $$|x| \geq a$$

$$x \leq a \quad and \quad x \geq -a$$ $$x \geq a \quad or \quad x \leq -a$$

"less than" ➡ *and*   *"greater than"* ➡ *or*

3. Solve and graph both inequalities