

Chapter 1D Absolute Value Inequalities

- solve absolute value inequalities
- No CCSS

Absolute Value Inequalities

Let's think about this before we use a rule:

a. $|x| < 3$

$\{x \mid -3 < x < 3\}$ $(-3, 3)$

A number line from -6 to 6 with tick marks every 1 unit. Open circles are drawn at -3 and 3. A red line segment connects these two circles, representing the solution set $-3 < x < 3$. The word "and" is written in red above the number line.

b. $|x| > 3$

$\{x \mid x < -3 \text{ or } x > 3\}$

A number line from -6 to 6 with tick marks every 1 unit. Open circles are drawn at -3 and 3. Green arrows point outwards from these circles, representing the solution set $x < -3$ or $x > 3$. The word "OR" is written in red above the number line.

Solving Absolute Value Inequalities

- isolate the absolute value.
- rewrite as two inequalities, compound inequalities. $x < \#$ and $x > \#$
 - > if less than, **AND** compound inequality less than AND
 - > if greater than, **OR** compound inequality greater OR
- solve the compound inequality as usual.

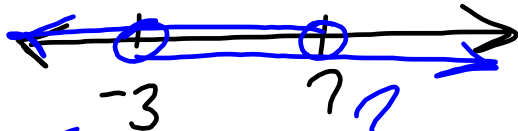
Examples: Solve.

1. $|4k - 8| < 20$ → less than AND

$$\frac{4k - 8 < 20 \text{ and } 4k - 8 > -20}{4k < 28 \quad 4k > -12}$$

$$k < 7$$

$$k > -3$$



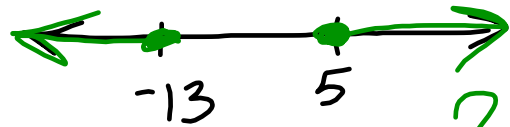
$$\{k \mid -3 < k < 7\}$$
$$(-3, 7)$$

2. $|g + 4| \geq 9$ → greater OR

$$g + 4 \geq 9 \text{ or } g + 4 \leq -9$$

$$g \geq 5$$

$$g \leq -13$$



$$\{g \mid g \leq -13 \text{ or } g \geq 5\}$$



1D Worksheet

