

L 1.7.2 Solving Absolute Value Inequalities

An absolute value inequality such as $|x - 2| < 4$ can be solved by rewriting it as a **compound inequality**, in this case as $-4 < x - 2 < 4$.

Transformations of Absolute Value Inequalities



- The inequality $|ax + b| < c$, where $c > 0$, means that $ax + b$ is between $-c$ and c . This is equivalent to $-c < ax + b < c$.
- The inequality $|ax + b| > c$, where $c > 0$, means that $ax + b$ is beyond $-c$ and c . This is equivalent to $ax + b < -c$ or $ax + b > c$.

In the first transformation, $<$ can be replaced by \leq . In the second transformation, $>$ can be replaced by \geq .

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Solve $|4x - 9| \leq 21$ "AND"

$$-21 \leq 4x - 9 \leq 21$$

$$-12 \leq 4x \leq 30$$

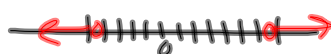
$$-3 \leq x \leq \frac{15}{2}$$



Solve $|3x - 2| > 18$

$$3x - 2 > 18 \quad \text{or} \quad 3x - 2 < -18$$

$$x > \frac{20}{3} \quad \text{or} \quad x < -\frac{16}{3}$$



Absolute Values in Real Life

A manufacturer has a 0.6 oz tolerance for a bottle of salad dressing advertised as 16 oz. Write and solve an absolute value inequality that describes the acceptable volumes for "16oz" bottles.

AV.
 15.4
 16.6
 "between"
 "and"
 \leq

$s = \text{bottle (actual bottle)}$

$$15.4 \leq s \leq 16.6$$

$$|s - 16| \leq 0.6$$

$$\begin{array}{ccc} -0.6 \leq s - 16 \leq 0.6 \\ +16 & +16 & +16 \end{array}$$

$$15.4 \leq s \leq 16.6$$

Absolute Values in Real Life

A city ordinance states that pools must be enclosed by a fence that is from 3ft to 6ft high. Write an absolute value inequality describing fences that don't meet this ordinance.

Assignment:

p. 53

42-58 even,
68, 70

Quiz 1.6-1.7 TOMORROW