

Solving Single-Step Inequalities

Solving inequalities is very similar to solving equations BUT you must pay attention to the direction of the inequality symbol!!!

Operations that DO NOT change the direction of the inequality symbol:

- Adding a number to both sides
- Subtracting a number from both sides
- Multiplying both sides by a positive number
- Dividing both sides by a positive number



Operations that DO change the direction of the inequality symbol:

- Multiplying both sides by a negative number
- Dividing both sides by a negative number

Examples

Solve each of the following:

Review:

$$\frac{2x}{2} = \frac{-10}{2}$$

$$x = -5$$

$x = -5$ is the only solution for the equation.

Example 2

Solve each of the following:

Review:

$$\frac{-4x}{-4} = \frac{-16}{-4}$$

$$x = 4$$

Only solution!

New:

$$\frac{2x}{2} > \frac{-10}{2}$$

$$x > -5$$

Any value greater than -5 is a solution to the inequality.

ex) $x = -4, -3, 1.67 \dots$

New:

$$\frac{-4x}{-4} \leq \frac{-16}{-4}$$

$$x \geq 4$$

Any value greater than OR equal to 4 is a solution!

Because we divided by a negative, the symbol MUST switch!

Outcomes:

PR4 - Single variable linear inequalities

Example 3

Solve each of the following:

Review: $3 \cdot -5 = \frac{x}{3}$

$$-15 = x$$

Only solution!

New: $3 \cdot -5 < \frac{x}{3}$

$$-15 < x$$

Any value of x greater than -15 is a solution!

ex) $x = -14, 0, 5, 126.32$ etc.

Example 4

Solve each of the following:

Review: $x - 3 = 2$

$$x = 2 + 3$$

$$x = 5$$

Only solution!

New: $x - 3 \geq 2$

$$x \geq 2 + 3$$

$$x \geq 5$$

Any solution greater than OR equal to 5 is a solution!

ex) $x = 10$

$$x - 3 \geq 2$$

$$\downarrow$$

$$10 - 3 \geq 2$$

$7 \geq 2$ TRUE statement



Practice the following:

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