

Algebra 1

5.3

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*7th grade standard

Solve multi-step linear inequalities*

Use the distributive property to solve linear inequalities*

GEM A

order of operations

distributive property

inequality

empty set

all real numbers

Whiteboards

Triangle puzzle

$$\begin{array}{r} 2x + 3 = 15 \\ +3 \quad +3 \\ \hline 2x = 18 \\ \frac{2}{2} \quad \frac{18}{2} \\ x = 9 \end{array}$$

$$3(x-2) = -6$$

$$\begin{array}{r} 3x - 6 = -6 \\ +6 \quad +6 \\ \hline 3x = 0 \end{array}$$

$$\frac{3x}{3} = \frac{0}{3} \quad x = 0$$

Quiz 5.1-5.2

What are steps to solve a multi-step
~~EQUATION?~~

$<$ $>$

$\leq$ $\geq$

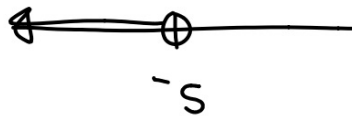
What would you do to solve an equation?

$$\begin{array}{rcl} -11y + 13 & = & 42 \\ +13 & +13 & \end{array}$$

Example 2 Inequality Involving a Negative Coefficient

Solve $-11y + 13 > 42$. Graph the solution on a number line.

$$\begin{array}{rcl} -11y + 13 & > & 42 \\ \hline -11y & > & 29 \\ \hline y & < & -\frac{29}{11} \end{array}$$



$$\text{2A. } 23 \geq 10 - 2w$$

$$\frac{13}{-2} \geq \frac{-2w}{-2}$$

$$-6.5 \leq w$$

$$w \geq -6.5$$

$$\underline{2B.} \quad 43 > -4y + 11$$

$$\quad \quad \quad \underline{-11} \quad \quad \quad \underline{-11}$$

$$\begin{array}{r} 32 > -4y \\ \underline{-4} \quad \quad \underline{-4} \end{array}$$

$$-8 < y$$

$$y > -8$$

Triangle puzzle

$$2(x-3) \geq -10$$

$$\begin{array}{rcl} 2x - 6 & \geq & -10 \\ +6 & & +6 \end{array}$$

$$\begin{array}{rcl} \hline 2x & \geq & -4 \\ \frac{2x}{2} & \geq & \frac{-4}{2} \end{array} \quad x \geq -2$$

Example 3 Write and Solve an Inequality



Define a variable, write an inequality, and solve the problem.

Five minus 6 times a number is more than four times the number plus 45.

Guided Practice

3. *Two more than half of a number is greater than twenty-seven.*

Example 4 Distributive Property

Solve $4(3t - 5) + 7 \geq 8t + 3$. Graph the solution on a number line.

4A. $6(5z - 3) \leq 36z$

4B. $2(h + 6) > -3(8 - h)$

What does it look like when there is no solution to an equation?

What does it look like when the solution is all real numbers?

Example 5 Empty Set and All Reals

Solve each inequality. Check your solution.

a. $9t - 5(t - 5) \leq 4(t - 3)$

b. $3(4m + 6) \leq 42 + 6(2m - 4)$

Solve each inequality. Check your solution.

5A. $18 - 3(8c + 4) \geq -6(4c - 1)$

5B. $46 \leq 8m - 4(2m + 5)$

