$\geq$ $\leq$

Algebra 1 5.3 *7th grade standard

Solve multi-step linear inequalities*

Use the distributive property to solve linear inequalities*

$3(x+2)$
$3 \cdot x + 3 \cdot 2$
$3x + 6$

order of operations
distributive property
inequality
empty set
all real numbers

Whiteboards
Triangle puzzle

$x + 3 = 5$
$-3 \quad -3$
$x = 2$

$\frac{2x}{2} = \frac{10}{2}$
$x = 5$

$2x + 1 = 7$
$-1 \quad -1$
$\frac{2x}{2} = \frac{6}{2}$
$x = 3$

What are steps to solve a multi-step EQUATION?

± zero pair

X÷ solve

X =

What would you do to solve an equation?

Example 2 Inequality Involving a Negative Coefficient

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

$-11y - 13 = 42$

$+13 \quad +13$

$\frac{-11y}{-11} = \frac{55}{-11}$

$y = -5$

$-11y - 13 > 42$

$+13 \quad +13$

$\frac{-11y}{-11} > \frac{55}{-11}$

$y < -5$

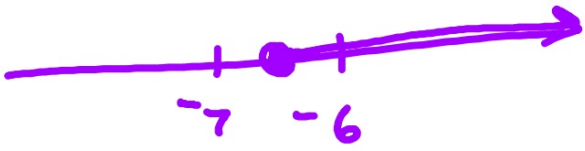
2A. $23 \geq 10 - 2w$

$-10 \quad -10$

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

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

-6.5



2B. $43 > -4y + 11$

$-11 \quad -11$

$+32 > -4y$

$\frac{+32}{-4} > \frac{-4y}{-4}$

$-8 < y$

$43 > -4y + 11$

$-11 \quad -11$

$\frac{32}{-4} > \frac{-4y}{-4}$

$-8 < y$

Triangle puzzle

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.

$$5 - 6n > 4n + 45$$
$$-45 \quad +6n \qquad +6n - 45$$
$$-40 > 10n$$
$$\frac{-40}{10} > \frac{10n}{10}$$
$$-4 > n$$

GuidedPractice

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.

$4 \cdot 3t \quad 4 \cdot -5$

$12t - 20 + 7 \geq 8t + 3$

$12t + -13 \geq 8t + 3$

$-8t \quad +13 \quad -8t + 13$

$\frac{4t}{4} \geq \frac{16}{4}$

$t \geq 4$

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