Solve Multiple Step Inequalities

Essential Question: Would an inequality with a final step of $5 < 5$ have no solution of infinitely many solutions?
Answer on your response card.

Solving inequalities is for the most part the same as solving equations. The only exception is that when you are solving, if you have to multiply or divide by a negative, you also have to flip/reverse the inequality symbol.

$<$ is less than	$>$ is greater than	$\leq$ is less than or equal to "at most"	$\geq$ is greater than or equal to "at least"

Example 1 Write and Solve an Inequality

Define a variable, write an inequality, and solve the problem. Then check your solution.

Sixteen plus three times a number is at most one-half of the number minus twelve.

Let z = the number

$16 + 3z \leq \frac{1}{2}z - 12$

$-\frac{1}{2}z \quad -\frac{1}{2}z$

$16 + 2.5z \leq -12$

$-16 \quad -16$

$\frac{2.5z}{2.5} \leq \frac{-28}{2.5}$

$z \leq -11.2$

Similar to equations, sometimes you have special solutions to an inequality.

No Solution
All real #'s / Infinitely Many

Solve each inequality, If possible.

a. $2(x+3) \leq \frac{1}{2}(4x+2) - 1$

$2x + 6 \leq 2x + 1 - 1$

$2x + 6 \leq 2x$

$-2x \quad -2x$

$6 \leq 0$

False — No Solution

b. $12(t+4) - 3t > 9(t+4)$

$12t + 48 - 3t > 9t + 36$

$9t + 48 > 9t + 36$

$-9t \quad -9t$

$48 > 36$

All real #'s

Whats it Look Like on STAAR?

What is the solution set for $-4x + 10 \geq 5x + 55$?

F $x \geq 5$

G $x \geq 45$

H $x \leq -5$

J $x \leq -45$

$+4x \quad +4x$

$10 \geq 9x + 55$

$-55 \quad -55$

$\frac{-45}{9} \geq \frac{9x}{9}$

$-5 \geq x$

$-4x + 10 \geq 5x + 55$

$-5x \quad -5x$

$-9x + 10 \geq 55$

$-10 \quad -10$

$\frac{-9x}{-9} \geq \frac{45}{-9}$

$x \leq -5$

Flip the Inequality

Laura solved the following inequality. She then gave her friend values in the solution set.

$$21p + 18 - 7 < p - 29$$

$21p + 11 < p - 29$

$-p \quad -p$

Which values could represent what Laura gave her friend? Select ALL that apply.

A. −2

B. 0

C. −1

D. −3

E. −14

$20p + 11 < -29$

$-11 \quad -11$

$\frac{20p}{20} < \frac{-40}{20}$

$p < -2$

Pick #'s smaller than −2