

4-4B & 4-4C Solving One-Step Inequalities

Equations – have an equal sign AND one solution.

Inequalities – have an inequality sign (<, >, ≤, or ≥) AND a solution set.

Solution Set – the set of all values of the variable that make the inequality true.

Inequality signs: 1. < less than points left

2. > greater than points right

3. ≤ less than or equal to

4. ≥ greater than or equal to

5. ≠ not equal to

* $x > 4$
 This means that
 $x = 4.1$ ✓
 $x = 7$ ✓
 $x = 100$.

To Solve Inequalities:

1. Use INVERSE OPERATIONS to ISOLATE THE VARIABLE (same as equations.)
2. When multiplying or dividing BOTH sides of the inequality by a NEGATIVE number – FLIP the inequality SIGN!!!

Graphing: (must have the variable on the left to graph!)

1. Draw a number line including arrows with five values with the solution in the middle.
2. Use open circle for < or > or a closed circle for ≤ or ≥.
3. SHADE in the solution set (including the arrow): Left for Less than, and Right for greater than

Ex. 1: Solve and graph each inequality.

A. $y - 9 < 11$



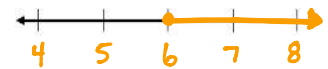
$$\begin{array}{r} y - 9 < 11 \\ +9 \quad +9 \\ \hline y < 20 \end{array}$$

B. $-7 \leq n + 9$



$$\begin{array}{r} -7 \leq n + 9 \\ -9 \quad -9 \\ \hline -16 \leq n \\ n \geq -16 \end{array}$$

C. $-21 + a \geq -15$



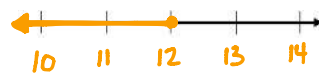
$$\begin{array}{r} -21 + a \geq -15 \\ +21 \quad +21 \\ \hline a \geq 6 \end{array}$$

D. $5x > 30$



$$\begin{array}{r} 5x > 30 \\ \frac{5x}{5} > \frac{30}{5} \\ \hline x > 6 \end{array}$$

E. $\frac{n}{4} \leq 3$



$$\begin{array}{r} 4\left(\frac{n}{4}\right) \leq (3)4 \\ \hline n \leq 12 \end{array}$$

F. $-4x \leq 4$



$$\begin{array}{r} -4x \leq 4 \\ \frac{-4x}{-4} \leq \frac{4}{-4} \\ \hline x \geq -1 \end{array}$$

flip the inequality sign when dividing by a negative number!!

G. $\frac{k}{-2} < 9$



$$\begin{array}{r} -2\left(\frac{k}{-2}\right) < (9)(-2) \\ \hline k > -18 \end{array}$$

flip the inequality sign when multiplying by a negative number!!