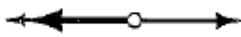



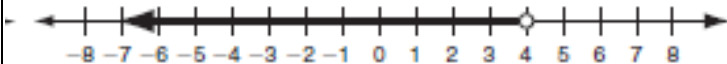
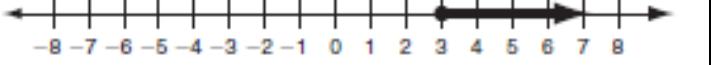
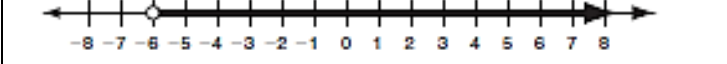
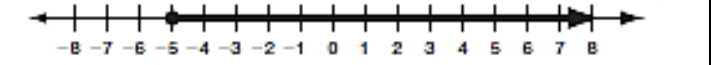


Solving Inequalities Cue Card – With Examples

Inequality Symbols: Always read from the variable!	Symbol	Words	Graph
	$<$	"less than"	
	\leq	"less than or equal to", "no more than", "at most"	
	$>$	"greater than"	
\geq	"greater than or equal to" "no less than" "at least"		

Example: $x > 5$ reads "x is greater than 5"; $5 > x$ reads "x is less than 5".

Inverse Operations: Addition & Subtraction Positive # & Negative # Multiplication & Division	When Multiplying or Dividing by a negative number FLIP THE SYMBOL!
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Solving 1-Step Inequalities Cue Card	
Step 1:	Use inverse operations to undo the number on the same side of the variable *FLIP the inequality sign if you multiply or divide by a negative number
<p>Solve $x + 3 < 7$ and graph the solutions.</p> $x + 3 < 7$ $\begin{array}{r} -3 \quad -3 \\ \hline x < 4 \end{array}$ <p><i>Subtract 3 from each side.</i></p> 	<p>Solve $x - 2 \geq 1$ and graph the solutions.</p> $x - 2 \geq 1$ $\begin{array}{r} +2 \quad +2 \\ \hline x \geq 3 \end{array}$ <p><i>Add 2 to each side.</i></p> 
<p>Solve $\frac{x}{3} > -2$ and graph the solution.</p> $\frac{x}{3} > -2$ $3 \cdot \frac{x}{3} > 3 \cdot (-2)$ <p><i>Multiply both sides by 3.</i></p> $x > -6$ 	<p>Solve $-2m \leq 10$ and graph the solutions.</p> $-2m \leq 10$ $\frac{-2m}{-2} \leq \frac{10}{-2}$ <p><i>Divide both sides by -2.</i></p> $m \geq -5$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> Dividing by a negative. Reverse inequality sign. </div> 

Solving 2-Step Inequalities Cue Card

Step 1:

Undo Addition or Subtraction to the number on the **same side of the variable** using inverse operations

Step 2:

Undo the multiplication or division
***FLIP the inequality sign if you multiply or divide by a negative number**

Solve $-5x + 3 < 23$ and graph the solutions.

$$-5x + 3 < 23$$

$$\begin{array}{r} -3 \quad -3 \\ \hline -5x < 20 \end{array} \quad \text{Add } -3 \text{ to each side.}$$

$$-5x < 20$$

$$\begin{array}{r} -5x < 20 \\ \hline -5 \quad -5 \end{array} \quad \text{Divide both sides by } -5.$$

$$x > -4 \quad \text{Reverse the inequality sign.}$$



$$\frac{y}{6} - 9 \leq 1$$

$$\frac{y}{6} - 9 \leq 1$$

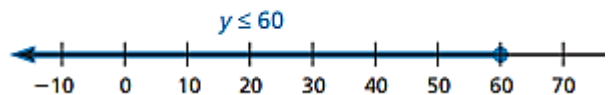
$$\frac{y}{6} - 9 \leq 1$$

$$\frac{y}{6} \leq 10$$

$$\frac{y}{6} \cdot 6 \leq 10 \cdot 6$$

$$y \leq 60$$

The solution is $y \leq 60$.



Solving Multi-Step Inequalities

Step 1:	Distribute	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 10px;">Multiply</div> $5(x + 6)$ </div> $5x + 30$
Step 2:	Combine Like Terms on the SAME side of the equal sign	$\underline{4a} + \underline{5} + \underline{2a} - \underline{3}$ $\mathbf{6a + 2}$
Step 3:	Is there a variable on both sides?	
	Yes; Use inverse operations to move the variable term to the left	No; Go to Step 4
Step 4:	Use inverse operations to undo the number on the same side of the variable (add or subtract)	
Step 5:	Use inverse operations to undo any multiplication or division * FLIP the inequality sign if you multiply or divide by a negative number	
	$-2(x + 3) < 10$ $-2x - 6 < 10$ $-2x - 6 + 6 < 10 + 6$ $-2x < 16$ <div style="display: flex; align-items: center; margin-top: 10px;"> $\frac{-2x}{-2} > \frac{16}{-2}$ <div style="border: 1px solid black; padding: 2px; margin-left: 10px; font-size: small;">Flip Inequality Sign!</div> </div> $x > -8$	$\begin{array}{r} 3x + 2 < x - 4 \\ -x \quad -x \\ \hline 2x + 2 < -4 \\ -2 \quad -2 \\ \hline 2x < -6 \\ \hline \frac{2x}{2} < \frac{-6}{2} \\ x < -3 \end{array}$

Solving Multi-Step Equations

Step 1:	Distribute	<div style="display: inline-block; border: 1px solid black; padding: 2px;">Multiply</div> $5(\overset{\curvearrowright}{x} + \overset{\curvearrowleft}{6})$ $5x + 30$
Step 2:	Combine Like Terms on the SAME side of the equal sign	$\underline{4a} + \underline{5} + \underline{2a} - \underline{3}$ $6a + 2$
Step 3:	Is there a variable on both sides?	
	Yes; Use inverse operations to move the variable term to the left	No; Go to Step 4
Step 4:	Use inverse operations to undo the number on the same side of the variable (add or subtract)	
Step 5:	Use inverse operations to undo any multiplication or division	

Solving Multi-Step Equations

Step 1:	Distribute	<div style="display: inline-block; border: 1px solid black; padding: 2px;">Multiply</div> $5(x + 6)$ $5x + 30$
Step 2:	Combine Like Terms on the SAME side of the equal sign	$4a + 5 + 2a - 3$ $6a + 2$
Step 3:	Is there a variable on both sides?	
	Yes; Use inverse operations to move the variable term to the left	No; Go to Step 4
Step 4:	Use inverse operations to undo the number on the same side of the variable (add or subtract)	
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Solving Multi-Step Inequalities		
Step 1:	Distribute	
Step 2:	Combine Like Terms on the SAME side of the equal sign	
Step 3:	Is there a variable on both sides?	
	Yes; Use inverse operations to move the variable term to the left	No; Go to Step 4
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