

**Warm Up** – Solve each of the following.

1.  $8 - (x + 5) = 6x - 2(x + 8) - 6$

2.  $4x + 4 = -2(x + 1) + 6x$

3.  $\frac{1}{2}x + 8 = 16$

4.  $\frac{x}{5} + 12 = -4$

5.  $\frac{1}{3}(9x + 12) = 4x - 2$

Inequalities:

$<$	$>$	$\leq$	$\geq$
less than	greater than	less than or equal to	greater than or equal to
Example: $10 < 20$ $-5 < -4$	Example: $30 > 9$ $-1 > -10$	Example: $10 \leq 20$ $-5 \leq -5$	Example: $20 \geq 10$ $-2 \geq -8$

Graphing Inequalities:

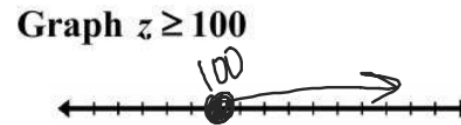
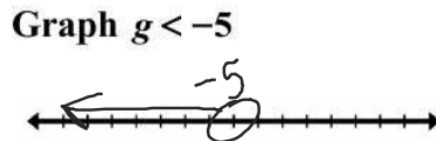
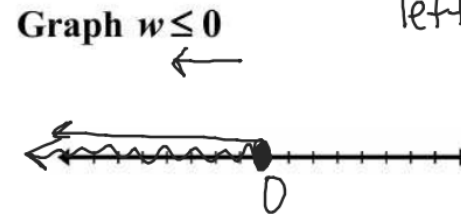
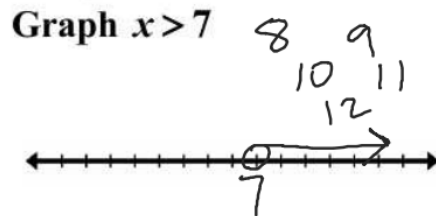
$\circ \rightarrow < \text{ or } >$

$\bullet \rightarrow \leq \text{ or } \geq$

$> \quad <$   
 $\rightarrow \quad \leftarrow$

Draw an arrow pointing in the same direction as the inequality symbol if the variable is on the left...

Ex 1:

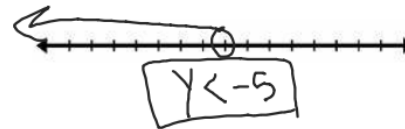


No Solution	vs.	All Real Numbers
The variable cancels and the inequality is FALSE		The variable cancels and the inequality is TRUE
<p>Negative Rule:</p> <p>If you multiply or divide both sides by a negative number you MUST SWITCH THE SYMBOL!!!</p>		

**Example 2** – Solve and then graph your answer on a number line.

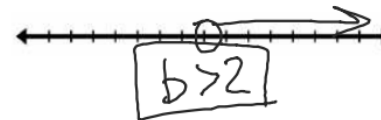
1.  $-11y - 13 > 42$

$$\begin{array}{r} -11y - 13 > 42 \\ +13 \quad +13 \\ \hline -11y > 55 \\ \frac{-11y}{-11} > \frac{55}{-11} \\ \boxed{y < -5} \end{array}$$



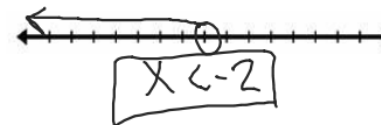
2.  $24 < 8b + 8$

$$\begin{array}{r} 24 < 8b + 8 \\ -8 \quad -8 \\ \hline 16 < 8b \\ \frac{16}{8} < \frac{8b}{8} \quad 2 < b \end{array}$$



3.  $-3(2x + 1) > 9$

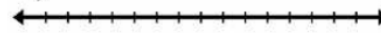
$$\begin{array}{r} -3(2x + 1) > 9 \\ -6x - 3 > 9 \\ -6x > 12 \\ \frac{-6x}{-6} > \frac{12}{-6} \\ \boxed{x < -2} \end{array}$$



4.  $-7(k+4)+11k \geq 8k-2(2k+1)$

$$-7k-28+11k \geq 8k-4k-2$$

$$4k-28 \geq 4k-2$$



5.  $2(4r-3) \leq 10+8(r-2)$

$$8r-6 \leq 10+8r-16$$

$$8r-6 \leq 8r-6$$



What if it had  $<$  instead?

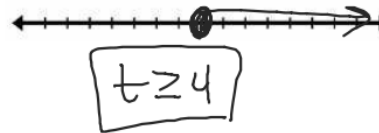
6.  $4(3t-5)+7 \geq 8t+3$

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

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

$$4t \geq 16$$

$$t \geq 4$$



7.  $5x+3 \leq 2x+9$

