

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

$$\begin{array}{r} 3x + 4 = 4x - 2 \\ -3x \quad -3x \\ \hline 4 = 1x - 2 \\ +2 \quad +2 \\ \hline 6 = 1x \quad x = 6 \end{array}$$

Inequalities:

$<$	$>$	\leq	\geq
less than	greater than	less than or equal to	greater than or equal to
Example: $10 < 30$ $20 < 30$	Example: $10 > -30$ $0 > -10$	Example: $2 \leq 2$ $-5 \leq 2$ $18 \leq 20$	Example: $100 \geq 99$ $4 \geq -2$

$-2 < 10$

Graphing Inequalities:

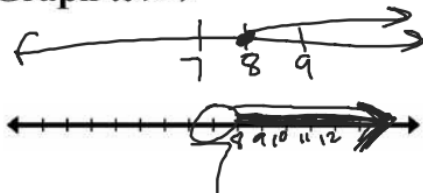
● $\rightarrow \leq$ or \geq

○ $\rightarrow <$ or $>$

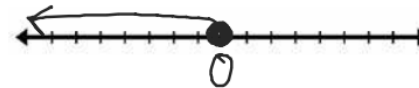
Draw an arrow from your dot going the same direction as the symbol. The variable must be on the left!!!

Ex 1: \rightarrow

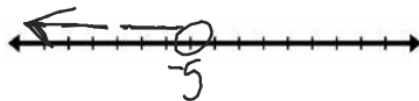
Graph $x > 7$



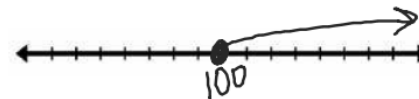
Graph $w \leq 0$



Graph $g < -5$



Graph $z \geq 100$

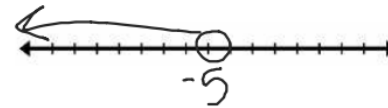


No Solution	vs.	All Real Numbers
The variable cancels and the inequality is false		The variable cancels and the inequality is true
Negative Rule: If you multiply or divide both sides of the inequality by a negative number, you MUST FLIP THE INEQUALITY SYMBOL!		

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

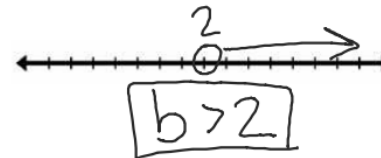
$$1. \quad -11y - 13 > 42$$

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



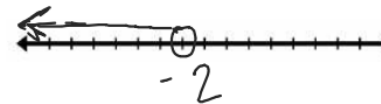
$$2. \quad 24 < 8b + 8$$

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

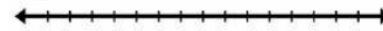


$$3. \quad -3(2x + 1) > 9$$

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



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



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



What if it had $<$ instead?

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



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

