

## Inequalities

3 Steps in Solving Inequalities.

1) Solve

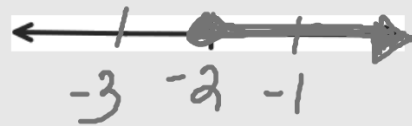
2) Graph

3) Check

Solve, graph, and check!

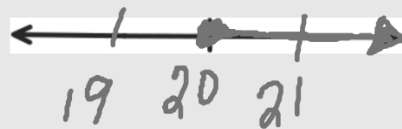
$$\begin{array}{r} x + 5 \geq 3 \\ -5 \quad -5 \\ \hline x \geq -2 \end{array}$$

$$\begin{array}{r} 0 + 5 \geq 3 \\ 5 \geq 3 \checkmark \end{array}$$



$$\begin{array}{r} 8 \leq m - 12 \\ +12 \quad +12 \\ \hline 20 \leq m \end{array}$$

$$\begin{array}{l} \text{Check:} \\ 8 \leq 21 - 12 \\ 8 \leq 9 \end{array}$$



$$20 \leq m \quad (m \geq 20)$$

$$\frac{3w}{3} \leq \frac{-15}{3}$$

$$w \leq -5$$



Check:

$$3(-6) \leq -15$$

$$-18 \leq -15 \checkmark$$

$$\frac{x}{6} + 3 \geq 7$$

$$\frac{x}{6} \geq 4$$

$$\frac{x}{6} \geq 4$$

$$x \geq 24$$



Check:

$$\frac{24}{6} + 3 \geq 7$$

$$6 + 3 \geq 7$$

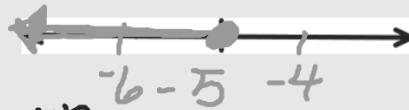
$$9 \geq 7$$

$$\begin{array}{r} -2x - 2 \geq 8 \\ +2 \quad +2 \end{array}$$

$$\begin{array}{r} -2x \geq 10 \\ -2 \quad -2 \end{array}$$

$$x \leq -5$$

flip ineq sign  
when mult or  
div by a neg #.



Check:

$$\begin{array}{r} -2(-6) - 2 \geq 8 \\ 12 - 2 \\ 10 \geq 8 \checkmark \end{array}$$

$$\begin{array}{r} 3 \cdot \frac{a}{-3} > 12 \\ \quad \quad \quad x=3 \end{array}$$

$$a < -36$$

Check:

$$\frac{-39}{-3} > 12$$

$$13 > 12 \checkmark$$



$$\begin{array}{r} -4x - 5 \geq 3 \\ +5 \quad +5 \end{array}$$

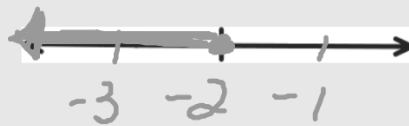
$$\begin{array}{r} -4x \geq 8 \\ -4 \quad -4 \end{array}$$

$$x \leq -2$$

$$\begin{array}{r} 4 \leq 2 + x \\ -2 \quad -2 \quad -4 \end{array}$$

$$\begin{array}{r} 2 \leq \frac{x}{-4} \\ -4 \end{array}$$

$$-8 \geq x$$



Check:

$$\begin{array}{r} -4(-3) - 5 \geq 3 \\ 12 - 5 \\ 7 \geq 3 \checkmark \end{array}$$



Check:

$$4 \leq 2 + \frac{-12}{-4}$$

$$\begin{array}{r} 4 \leq 2 + 3 \\ 4 \leq 5 \checkmark \end{array}$$