

Solving Inequalities

Follow the same steps as solving equations

1. Simplify each side
2. Get all the variables on one side and plain numbers on the other
3. Get the variable by itself

Except: If you multiply or divide both sides by a negative number, you **MUST flip the inequality sign

Inequality Signs:

| | |
|--------------------------|--------|
| Greater Than | $>$ |
| Less Than | $<$ |
| Greater Than or Equal To | \geq |
| Less Than or Equal To | \leq |

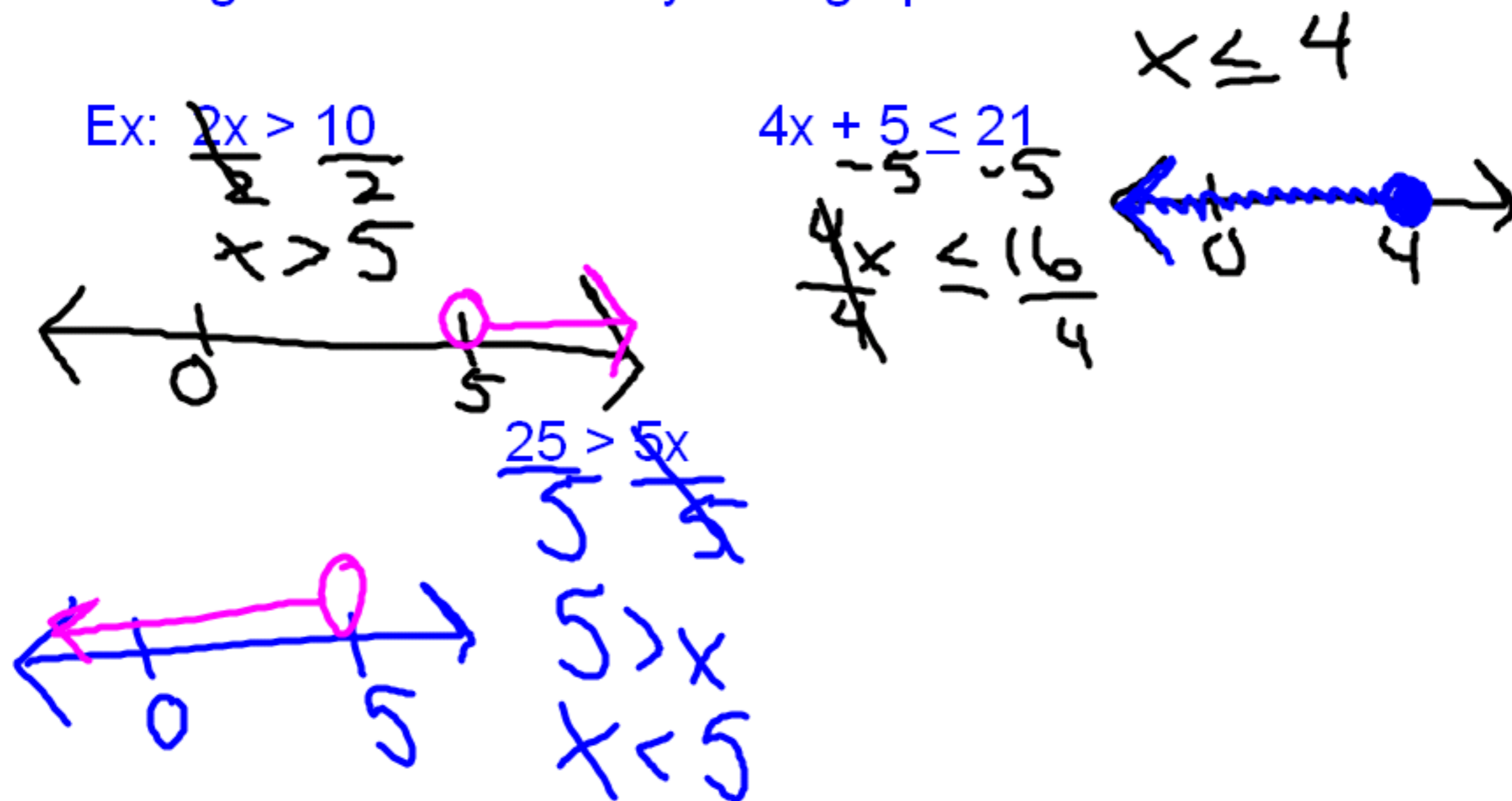
When graphing inequalities follow these rules:

If your sign is $<$ or $>$ then your circle is OPEN

If your sign is \leq or \geq then your circle is CLOSED

Always get your variable on the left

Your arrow goes the direction your sign points



Solve and Graph on a number line

$$\frac{3x}{3} < \frac{10}{3}$$

$$x < 3.3$$



$$\begin{array}{r} 7x - 30 < 19 \\ +30 \quad +30 \end{array}$$

$$\frac{7x < 49}{7 \quad 7}$$

$$x < 7$$

$$3x - 2 \geq 7x - 10$$

$$\begin{array}{r} -7x \quad -7x \\ \hline -4x - 2 \geq -10 \\ +2 \quad +2 \end{array}$$

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

~~$$\frac{-3x}{3} < \frac{10}{3}$$~~

~~$$x < -3.3$$~~



$$\frac{3x}{3} < \frac{-10}{3}$$

$$x < -3.3$$



$$\begin{array}{r} -7 - 4x < 13 \\ +7 \quad +7 \end{array}$$

~~$$\frac{-4x < 20}{-4 \quad -4}$$~~

~~$$x > -5$$~~

$$7x - 2 \leq -3(x - 2)$$

$$\begin{array}{r} 7x - 2 \leq -3x + 6 \\ +3x \quad +3x \\ \hline 10x - 2 \leq 6 \\ +2 \quad +2 \\ \hline 10x \leq 8 \\ \frac{10x}{10} \leq \frac{8}{10} \end{array}$$

$$x \leq .8$$

$$\begin{array}{r} -16 \leq 3x - 4 \leq 2 \\ +4 \quad +4 \quad +4 \\ \hline -12 \leq 3x \leq 6 \\ \frac{-12}{3} \leq \frac{3x}{3} \leq \frac{6}{3} \\ -4 \leq x \leq 2 \end{array}$$

$$\begin{array}{r} -16 \leq 3x + 4 \\ +4 \quad +4 \\ \hline -12 \leq 3x \\ \frac{-12}{3} \leq \frac{3x}{3} \\ -4 \leq x \end{array}$$

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