

**Objective:** Solve one variable inequalities.

**Example:**

$$3x + 2 < 5$$

$$\begin{array}{r} -2 \quad -2 \\ \hline 3x < 3 \end{array}$$

Subtraction Property of Inequality

$$3x < 3$$

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

Division Property of Inequality

$$x < 1$$

Choose a number  $< 1$  and see if it works.

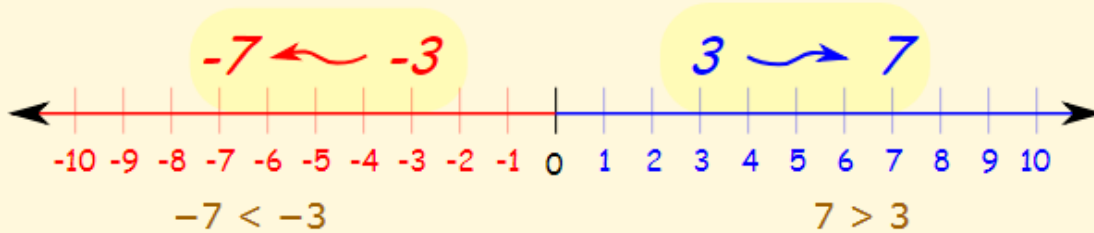
**REMEMBER:**

When multiplying or dividing by a **NEGATIVE**, **FLIP** the inequality sign.

**Why?**

Well, just look at the number line!

For example, from 3 to 7 is an **increase**,  
but from  $-3$  to  $-7$  is a **decrease**.



See how the inequality sign reverses (from  $<$  to  $>$ ) ?

**Example:**

$$-2x \geq 8$$

$$\frac{-2x}{-2} \geq \frac{8}{-2}$$

$$x \geq -4$$

Choose a number  $\geq -4$

$$-2x \geq 8$$

$$\frac{-2x}{-2} \leq \frac{8}{-2}$$

$$x \leq -4$$

Choose a number  $\leq -4$

Which is correct???

1.  $-4 + 5x < 31$

2.  $\frac{x}{6} + 3 \leq -2$

3.  $\frac{x-9}{-2} \geq 5$

4.  $-8x + 19 + 12x > 3$

5.  $19 \geq 7 - 3x$

6.  $3(5x + 8) < -21$

7.  $-3x + 11 \geq 6x + 29$

8.  $\frac{-4x}{5} - 7 \leq 1$

## Challenge Problems:

$$*9. \frac{-4x+13}{5} > 3$$

$$*10. -2(3x + 2) < -8(x - 5)$$

$$*11. -2(2 - 2x) - 4(x + 5) \leq -24$$

$$*12. -2 < \frac{6-2x}{-3} < 4$$