

Lesson 8 - Solving Linear Inequalities Day 2

- Solving Compound Inequalities
 - Graphing Compound Inequalities on a Number line
-

Refresher from Last Lesson:

Solve and graph the following on a number line...

$$2x + 1 < 5x - 11$$

(Handwritten work showing steps to solve the inequality)

$$-3x + 1 < -11$$

(Subtracting 5x from both sides)

$$\frac{-3x}{-3} < \frac{-12}{-3}$$

(Dividing both sides by -3, resulting in x > 4)

$$1 < 3x - 11$$

(Adding 11 to both sides)

$$\frac{12}{3} < \frac{3x}{3}$$

(Dividing both sides by 3, resulting in 4 < x)

(Swapping the inequality to x > 4)

x > 4

Compound Inequalities.

There are two main types of compound inequalities. "Or" problems and "Between" problems.

"Or" problems:

- Just solve each inequality separately. Then
- graph both solutions on one number line.

$$\begin{array}{ccc} x + 1 < 5 & \text{or} & \frac{2x}{2} > \frac{16}{2} \\ -1 & & -1 \\ x < 4 & \text{or} & x > 8 \end{array}$$



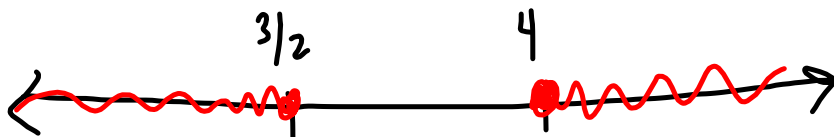
Ex: $2(x-5) \leq -7$ or $3x-6 \geq 6$

$$2x - 10 \leq -7$$

$$\frac{2x}{2} \leq \frac{3}{2}$$

$$\frac{3x}{3} \geq \frac{12}{3}$$

$$x \leq \frac{3}{2} \quad \text{or} \quad x \geq 4$$



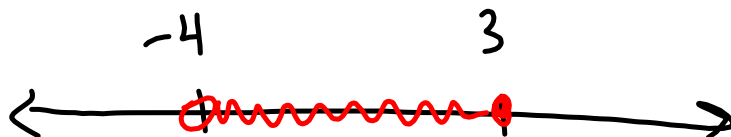
"Between" problems:

"Between" problems are named for having their variable sandwiched "between" two inequalities. What you do to the middle section, you do to each of the two sides.

$$\underset{-5}{-3} < \underset{-5}{2x + 5} \leq \underset{-5}{11}$$

$$\frac{-8}{2} < \frac{2x}{2} \leq \frac{6}{2}$$

$$-4 < x \leq 3$$



Ex:

$$8 \leq 3 - 5x < 28$$

$-3 \quad -3 \quad -3$

$$\frac{8}{-5} \leq \frac{-5x}{-5} < \frac{25}{-5}$$

$$-1 \geq x > -5$$

