

Name: _____

Math 7.2, Period _____

Mr. Rogove

Date: _____

LEARNING OBJECTIVE: We will solve compound equations and inequalities that are connected by “and” or “or”. (Alg1M1L8)

ACTIVATING PRIOR KNOWLEDGE:

Compound Sentence: A compound sentence has two **independent** clauses or sentences joined by a conjunction like “and” or “or.”

Examples:

- I am in math class right now **and** it is Tuesday.
- I have \$20 in my wallet right now **or** I have candy in my backpack.

*BOTH CONDITIONS!
ONLY NEED ONE
CONDITION!*

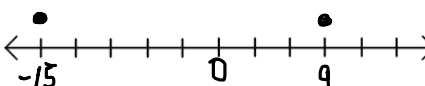
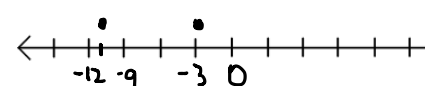
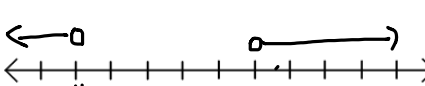
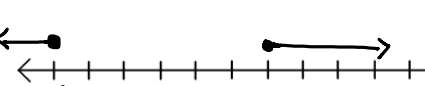
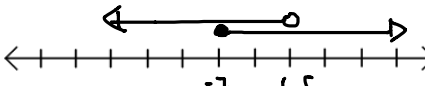
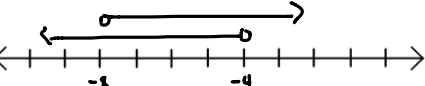
CONCEPT DEVELOPMENT:

Compound Equations and Inequalities work much the same way.

“AND” Compound Equations/inequalities	“OR” Compound Equations/Inequalities
In order to be included in the solution set, the solution must make both equations (or inequalities) true.	In order to be included in the solution set, the solution must make one of the equations (or inequalities) true.
<p><u>Equation Examples:</u></p> $x + 2 = 9 \text{ and } x - 4 = 3$ $x = 7 \text{ and } x = 7$ $\{7\}$ $x + 5 = 11 \text{ and } x = 2$ $x = 6 \text{ and } x = 2$ <p>The empty set \emptyset</p>	<p><u>Equation Example:</u></p> $4x + 9 = 0 \text{ or } 3x + 5 = 2$ $x = \frac{-9}{4} \text{ or } x = -1$ $\left\{-1, \frac{9}{4}\right\}$
<p><u>Inequality Examples:</u> <i>AND</i></p> <div style="border: 1px solid black; padding: 5px; display: inline-block;"> $2x > 8 \text{ and } 3x < 15$ $x > 4 \text{ and } x < 5$ $4 < x < 5$ </div> $6x > 18 \text{ and } 4x < -3$ $x > 3 \text{ and } x < -\frac{3}{4}$ <p>The null set \emptyset</p>	<p><u>Inequality Examples:</u> <i>OR</i></p> $4x \leq 14 \text{ or } -12x > 15$ $x \leq \frac{7}{2} \text{ or } x < -\frac{5}{4}$ $x \leq \frac{7}{2}$ $-3x \geq -9 \text{ or } x = 12$ $x \leq 3 \text{ or } x = 12$ $x = 12 \text{ or } x \leq 3$

GUIDED PRACTICE:**Steps for Solving and Graphing Compound Equations and Inequalities**

- ✓ 1. Identify the conjunction "and" or "or".
- ✓ 2. Graph both equations and/or inequalities on the number line.
- ✓ 3. Rewrite the solution set.

$x - 9 = 0 \text{ or } x + 15 = 0$ $\begin{array}{l} +9 \quad +9 \\ x = 9 \end{array} \quad \left\{ \begin{array}{l} -15 \quad -15 \\ x = -15 \end{array} \right.$ $\{9, -15\}$ 	$5x - 8 = -23 \text{ or } x + 1 = -10$ $\begin{array}{l} +8 \quad +8 \\ 5x = -15 \\ \underline{\quad} \\ x = -3 \end{array} \quad \left\{ \begin{array}{l} -1 \quad -1 \\ x = -1 \end{array} \right.$ 
$x < -4 \text{ or } \frac{3x}{3} > \frac{3}{3}$ $\left\{ \begin{array}{l} x < -4 \\ x > 1 \end{array} \right.$ $\boxed{x < -4 \text{ or } x > 1}$ 	$\frac{2x}{2} \leq \frac{-10}{2} \text{ or } \frac{4x}{4} \geq \frac{4}{4}$ $\left\{ \begin{array}{l} x \leq -5 \\ x \geq 1 \end{array} \right.$ $\boxed{x \leq -5 \text{ or } x \geq 1}$ 
$3x \geq -21 \text{ or } 2x < -13$ $\left\{ \begin{array}{l} x \geq -7 \\ x < -6.5 \end{array} \right.$ $\{ \mathbb{R} \}$ <p>The set of all real #s.</p> 	$3x < -12 \text{ or } 20x > -160$ $\left\{ \begin{array}{l} x < -4 \\ x > -8 \end{array} \right.$ 

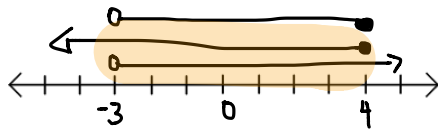
COMPOUND
INEQUALITY
AND

$$x > -3 \text{ and } 2x \leq 8$$

$$\left\{ \begin{array}{l} x \leq 4 \end{array} \right.$$

$$\boxed{-3 < x \leq 4}$$

$$4 \geq x > -3$$

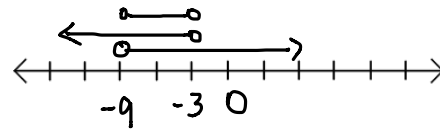


OVERLAP IS SOLUTION

$$9x < -27 \text{ and } 3x > -27$$

$$\left\{ \begin{array}{l} x < -3 \end{array} \right. \left\{ \begin{array}{l} x > -9 \end{array} \right.$$

$$\boxed{-9 < x < -3}$$

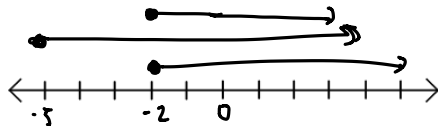


$$2x \geq -4 \text{ and } 6x \geq -30$$

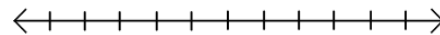
$$x \geq -2 \left\{ \begin{array}{l} x \geq -5 \end{array} \right.$$

$$\boxed{x \geq -2}$$

$$\boxed{\{x \in \mathbb{Q} \mid x \geq -2\}}$$



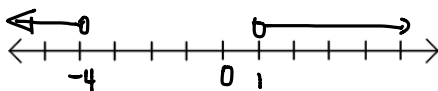
$$3x - 4 \leq 2 \text{ and } 5x + 3 \leq 23$$



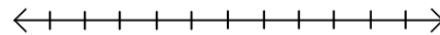
$$x < -4 \text{ and } 3x > 3$$

$$x < -4 \left\{ \begin{array}{l} x > 1 \end{array} \right.$$

$\{ \}$ or \emptyset , Null set!



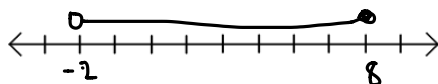
$$2x \leq -10 \text{ and } 4x \geq 4$$



Rewrite as a compound inequality and graph the solution:

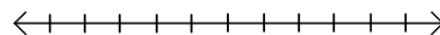
$$\boxed{-2 < x \leq 8}$$

$$x > -2 \text{ and } x \leq 8$$



Rewrite as a compound inequality and graph the solution:

$$4 \geq x > 0$$



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INDEPENDENT PRACTICE:

Khan Academy ^②Compound Inequalities: 10 in a row

① Multi-Step Linear Inequalities

CLOSURE:

Mercury is one of two elements that is liquid at room temperature. Mercury is non-liquid for temperatures less than -38°F or greater than 673.8°F . Write a compound inequality for the temperature at which mercury is NON-liquid.

$$x < -38 \quad \text{or} \quad x > 673.8$$

NOTES:

This maps to Lesson 15 of Alg 1 Mod 1 ENY
Homework is Problem Set from Lesson 15