Name: _____ Math 7.2, Period _____

Mr. Rogove Date: _____

Learning Objective:

We will solve compound equations and inequalities that are connected by "and" or "or". (Lesson 88)

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. FALSE
- I have $20 in my wallet right now **or** I have candy in my backpack. TRUE

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.
Equation Examples: $x + 2 = 9$ and $x - 4 = 3$ $x = 7$ and $x = 7$ $\{\mathbf{7}\}$ $x + 5 = 11$ and $x = 2$ $x = 6$ and $x = 2$ **The empty set** $\emptyset$	*Equation Example:* $4x + 9 = 0$ or $3x + 5 = 2$ $x = -\frac{9}{4}$ or $x = -1$ $\left\{-\mathbf{1}, \frac{-\mathbf{9}}{\mathbf{4}}\right\}$
Inequality Examples: $2x > 8$ and $3x < 15$ $6 > 4$ $x > 4$ and $x < 5$ $\mathbf{4 < x < 5}$ $6x > 18$ and $4x < -3$ $x > 3$ and $x < -\frac{3}{4}$ **The null set** $\emptyset$	*Inequality Examples:* $4x \leq 14$ or $-12x > 15$ $x \leq \frac{7}{2}$ or $x < -\frac{5}{4}$ $\boldsymbol{x \leq \frac{7}{2}}$ $-3x \geq -9$ or $x = 12$ $x \leq 3$ or $x = 12$ $\boldsymbol{x = 12 \text{ or } x \leq 3}$

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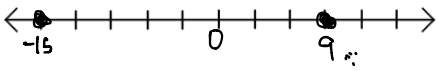
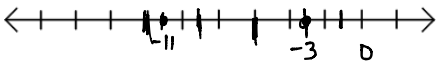
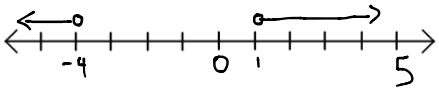
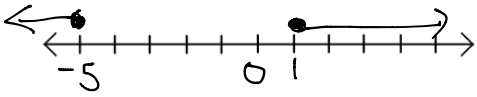
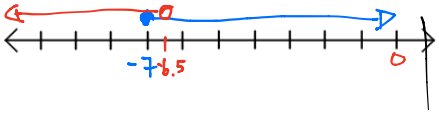
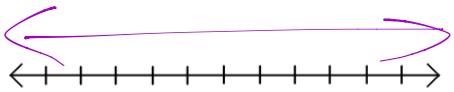
Guided Practice:

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.

$x - 9 = 0$ or $x + 15 = 0$ $x = 9$ or $x = -15$ $\{9, -15\}$ 	$5x - 8 = -23$ or $x + 1 = -10$ $x = -3$ or $x = -11$ $\{-3, -11\}$ 
$x < -4$ or $\frac{3x}{3} > \frac{3}{3}$ $x > 1$ $\boxed{x < -4 \text{ or } x > 1}$ 	$2x \le -10$ or $4x \ge 4$ $x \le -5$ $x \ge 1$ $\boxed{x \le -5 \text{ or } x \ge 1}$ 
$3x \ge -21$ or $2x < -13$ $x \ge -7$ $x < -6\frac{1}{2}$ $x = -6.5$ $\{\mathbb{R}\}$ 	$3x < -12$ or $20x > -160$ $\boxed{x < -4 \text{ or } x > -8}$ $\{\mathbb{R}\}$ 

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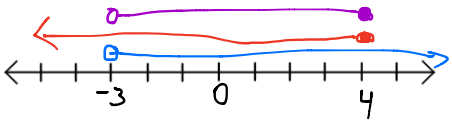
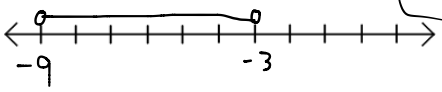
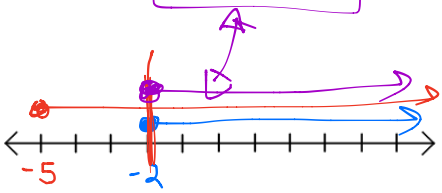
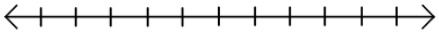
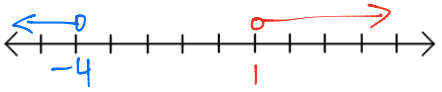
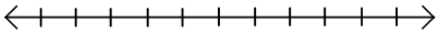
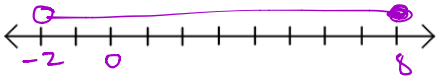
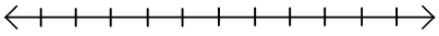
$x > -3$ and $2x \le 8$ $x > -3$ $x \le 4$ $\boxed{-3 < x \le 4}$  	$9x < -27$ and $3x > -27$ $-3 > x > -9$ $\boxed{-9 < x < -3}$ $\boxed{x > -9 \text{ and } x < -3}$ $\{-9, -3\}$ 
$2x \ge -4$ and $6x \ge -30$ $x \ge -2$ $x \ge -5$ $\boxed{x \ge -2}$  	$3x - 4 \le 2$ and $5x + 3 \le 23$ 
$x < -4$ and $3x > 3$ $x < -4$ $x > 1$ Null set, $\emptyset$, $\{\}$  	$2x \le -10$ and $4x \ge 4$ 
Rewrite as a compound inequality and graph the solution: $-2 < x \le 8$ $x > -2$ and $x \le 8$  	Rewrite as a compound inequality and graph the solution: $\boxed{4 \ge x > 0}$ $4 \ge -1 > 0$ 

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Independent Practice:

Khan Academy Compound Inequalities: 10 in a row

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.

Notes:

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