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.

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 $x = -1$ $\left\{\mathbf{-1}, \mathbf{\frac{9}{4}}\right\}$
Inequality Examples: $2x > 8$ and $3x < 15$ $x > 4$ 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 $x = 12$ $\boldsymbol{x = 12}$ ***or*** $\boldsymbol{x \leq 3}$

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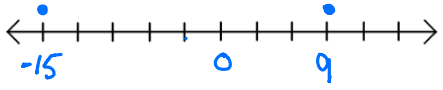
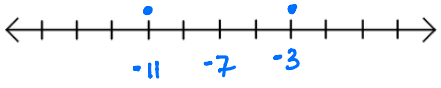
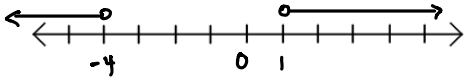
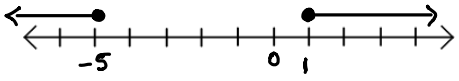
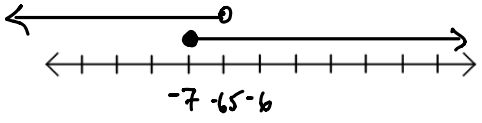
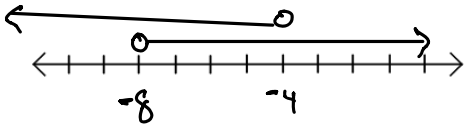
Guided Practice:

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 $x + 15 = 0$ +9 +9 -15 -15 $x = 9$ $x = -15$ $\{-15, 9\}$ 	$5x - 8 = -23$ or $x + 1 = -10$ $5x = -15$ $x = -3$ OR $x = -11$ 
$x < -4$ or $3x > 3$ $x < -4$ or $x > 1$ 	$2x \leq -10$ or $4x \geq 4$ $x \leq -5$ or $x \geq 1$ 
$3x \geq -21$ or $2x < -13$ $x \geq -7$ or $x < -6.5$ $\{\mathbb{R}\}$ 	$3x < -12$ or $20x > -160$ $x < -4$ or $x > -8$ $\{\mathbb{R}\}$ 

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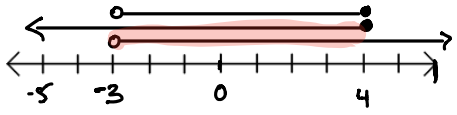
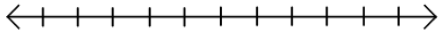
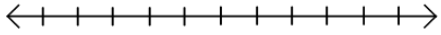
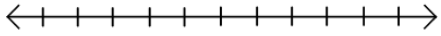
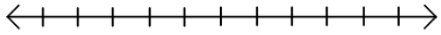
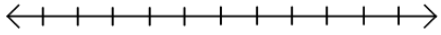
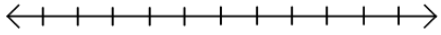
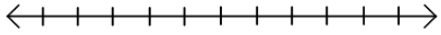
$x > -3$ and $2x \leq 8$ $x \leq 4$ $4 \geq x > -3$ $-3 < x \leq 4$  	$9x < -27$ and $3x > -27$ 
$2x \geq -4$ and $6x \geq -30$ 	$3x - 4 \leq 2$ and $5x + 3 \leq 23$ 
$x < -4$ and $3x > 3$ 	$2x \leq -10$ and $4x \geq 4$ 
Rewrite as a compound inequality and graph the solution: $-2 < x \leq 8$ 	Rewrite as a compound inequality and graph the solution: $4 \geq x > 0$ 

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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