

LEARNING OBJECTIVE: We will solve and graph compound inequalities.
(Alg1M1L9)

CONCEPT DEVELOPMENT:

Compound Inequalities come in different formats sometime...

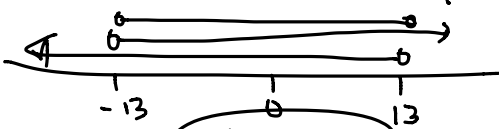
Example #1: Solve $a^2 < 169$

$$a^2 < 169 \text{ AND } (-a)^2 < 169$$

$$a < 13 \quad \frac{-a}{-1} < \frac{13}{-1}$$

$$a > -13$$

$$13 > a > -13$$

$$-13 < a < 13$$


Example #2: Rewrite $-5 < x < 4$ as a compound statement of inequality:

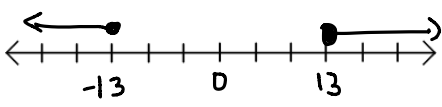
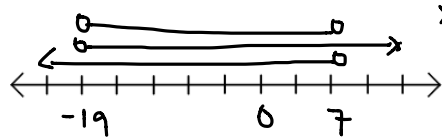
AND

$$x > -5 \text{ and } x < 4$$

GUIDED PRACTICE:

Steps for Solving and Graphing Compound Inequalities

1. Solve each individual inequality.
2. Note whether the compound inequality is combined by "and" or "or".
3. Graph the solution set on a number line.

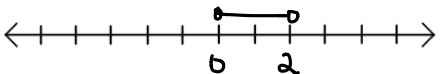
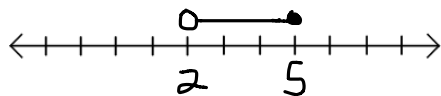
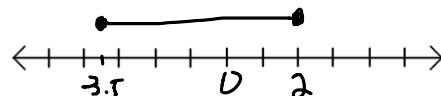
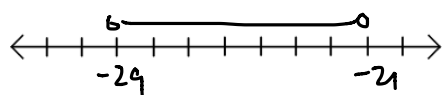
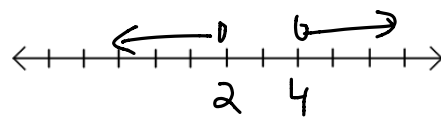
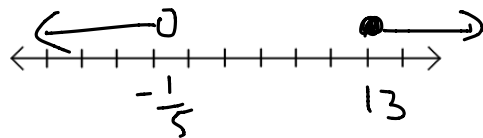
$x^2 \geq 169 \text{ OR } (-x)^2 \geq 169$ $x \geq 13 \quad \frac{-x}{-1} \geq \frac{13}{-1}$ $x \leq -13$ 	$(x+6)^2 < 169 \text{ AND } -(x+6)^2 < 169$ $x+6 < 13 \quad \frac{-x(x+6)}{-1} < \frac{13}{-1}$ $x < 7 \quad x+6 > -13$ $x > -19$ 
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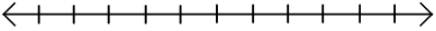
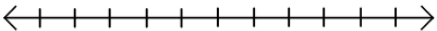
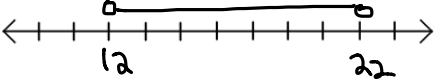
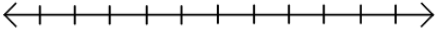
$x + 6 < 8 \text{ and } x - 1 > -1$ $x < 2 \quad \left\{ \quad x > 0 \right.$ $2 > x > 0$ 	$5x - 2 > 8 \text{ and } 3x + 2 \leq 17$ $x > 2 \quad \left\{ \quad x \leq 5 \right.$ $2 < x \leq 5$ 
$\frac{-1}{-3} \leq \frac{3}{-3} - 2x \leq \frac{10}{-3}$ $\frac{-4}{-2} \leq \frac{-2x}{-2} \leq \frac{7}{-2}$ $2 \geq x \geq -3.5$ 	$-2 \left(12 > -\frac{1}{2}(x+5) > 8 \right)$ $\frac{-24}{-5} < \frac{x+5}{-5} < \frac{-16}{-5}$ $-29 < x < -21$ 
$x + 4 < 6 \text{ or } x - 1 > 3$ $x < 2 \quad \left\{ \quad x > 4 \right.$ 	$5x + 1 < 0 \text{ or } 8 \leq x - 5$ $x < -\frac{1}{5} \quad \left\{ \quad 13 \leq x \right.$ 

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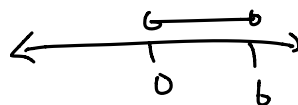
$x + 4 < 6$ and $x - 1 > 3$ $x < 2$ } $x > 4$ $\{ \}, \emptyset$ EMPTY SET! 	$5x + 1 < 0$ and $8 \leq x - 5$ EMPTY SET! 
$6 < \frac{x}{2} < 11$ $12 < x < 22$ 	$14 \geq \frac{x-1}{3} > 11$ 

CLOSURE:

Find the solution set for the following:

$$\frac{-1}{(x-3)^2} < 9$$

$$\begin{array}{l} -(x-3) < 3 \\ x-3 > -3 \\ +3 \quad +3 \\ x > 0 \end{array} \quad \left\{ \begin{array}{l} x-3 < 3 \\ +3 \quad +3 \\ x < 6 \end{array} \right.$$



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INDEPENDENT PRACTICE:

Do problem set for independent practice...

ACTIVATING PRIOR KNOWLEDGE:

“Number Talk”

A rectangle is 5 inches long by 11 inches wide. If each side length is doubled, by what percentage does the area increase?

What if side length is tripled? What does that do to the area as a percentage of the original 5 x 11 rectangle?

A square has a side length of 24 inches. If you reduce each side length to 6 inches, what is the ratio of the area of the smaller square to the larger square

NOTES:

This maps to lesson 16 from Alg 1 Mod 1 of ENY

Complete Problem Set or Compound Inequalities (10 in a row)