

Algebra 1

Chapter 3

Section 3-6

May 13-10:02 PM

Review: Solving Inequalities

$$19c + 10.5 > 15.5$$

$$\cancel{-10.5} \quad \cancel{-10.5}$$

$$\frac{\cancel{19}c}{\cancel{19}} > \frac{5}{\cancel{19}}$$

$$\underline{c} > \frac{5}{19}$$

$$16 - 7f > -6f - 21$$

$$\cancel{-16} \quad \cancel{-16}$$

$$-7f > -6f - 37$$

$$+6f \quad +6f$$

$$\cancel{(-1)} - \cancel{1}f > -37 \quad (-1)$$

$$f < 37$$

Sep 29-3:15 PM

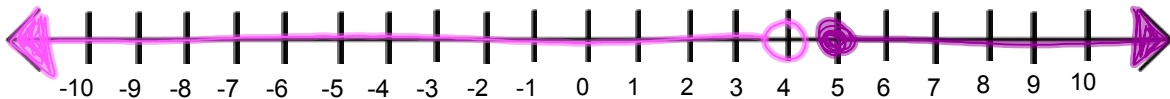
Compound Inequalities

A compound inequality is made up of two different inequalities (separated by "and" or "or")

Graph the compound inequality

$$\underline{x \geq 5} \text{ or } \underline{x < 4}$$

at least one inequality is true

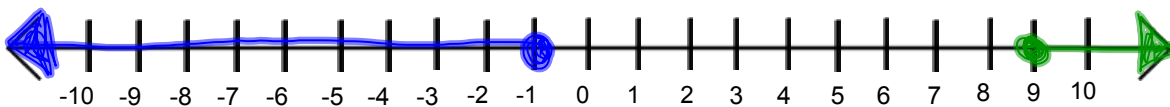


Oct 14-6:00 PM

Compound Inequalities

Graph the compound inequality

$$\underline{x \leq -1} \text{ or } \underline{x \geq 9}$$

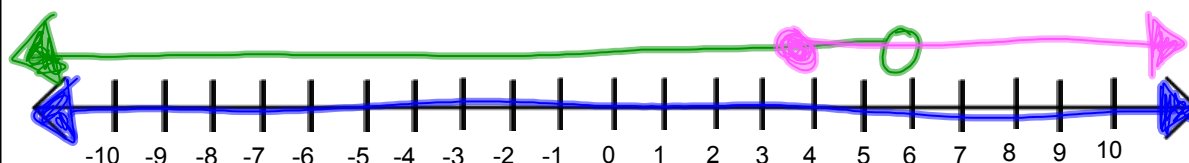


Oct 14-6:00 PM

Compound Inequalities

Graph the compound inequality

$$\underline{x < 6} \quad \text{or} \quad \underline{x \geq 4}$$

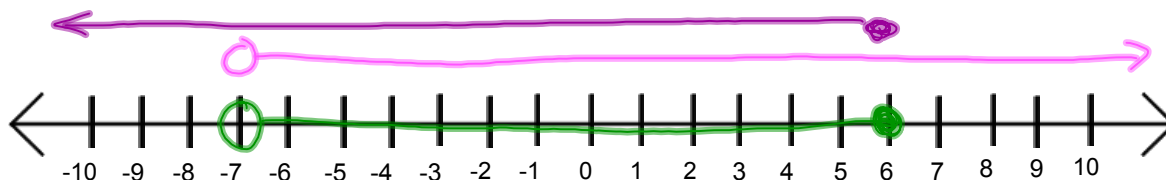


Oct 14-6:00 PM

Compound Inequalities

Graph the compound inequality and, if possible, rewrite as a single statement

$$\underline{x \leq 6} \quad \text{and} \quad \underline{x > -7}$$

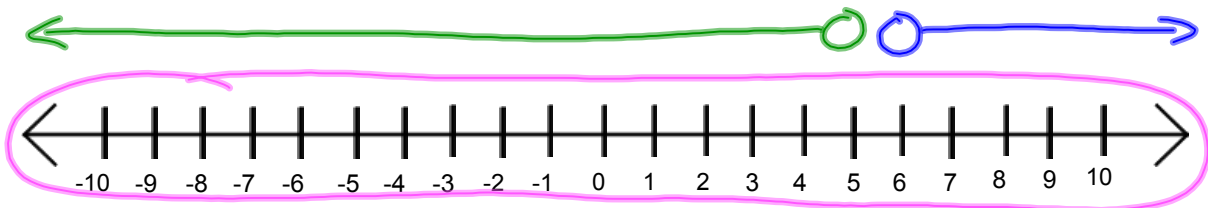


Oct 14-6:00 PM

Compound Inequalities

Graph the compound inequality and, if possible, rewrite as a single statement

$$\underline{x > 6} \text{ and } \underline{x < 5}$$



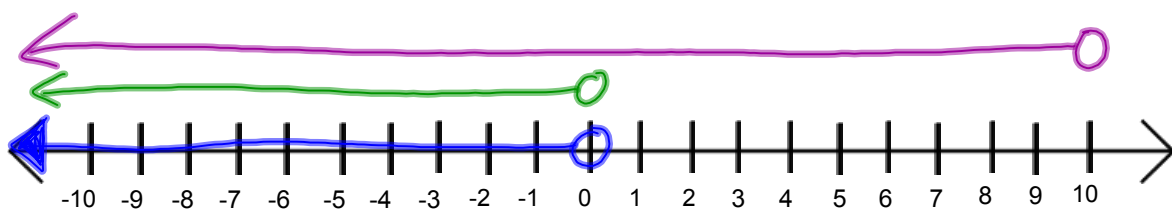
No solution \rightarrow no line

Oct 14-6:00 PM

Compound Inequalities

Graph the compound inequality and, if possible, rewrite as a single statement


$$\underline{x < 0} \text{ and } \underline{x < 10}$$



Oct 14-6:00 PM

Solve the Compound Inequalities

$$5 < 3x + 11 \leq 29$$

$$\begin{array}{ccc} -11 & -11 & -11 \\ \hline -6 & < 3x & \leq 18 \\ \hline \frac{-6}{3} & & \frac{18}{3} \\ \hline -2 & < x & \leq 6 \end{array}$$


$$2x < x - 3 \text{ or } x - 21 > 3$$

$$\begin{array}{ccc} -x & -x & +21 \quad +21 \\ \hline x & < -3 & \text{ or } x > 24 \end{array}$$

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Interval Notation

Interval notation is a way of writing an interval for a given variable using parentheses or brackets

Examples: 

$$(-1, 0]$$

$$-1 < x \leq 0$$

$$(-\infty, 16)$$

$$x < 16$$

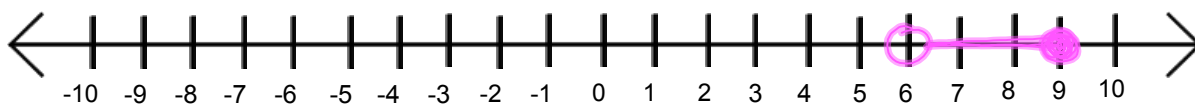
Sep 29-3:15 PM

Interval Notation

Rewrite the following intervals as inequalities, then graph.

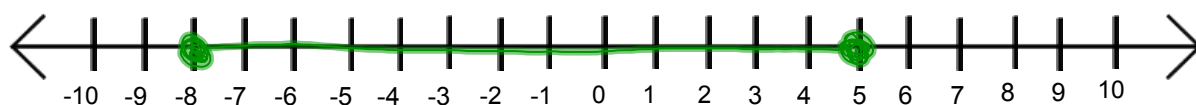
$$(6, 9]$$

$$6 < x \leq 9$$



$$[-8, 5]$$

$$-8 \leq x \leq 5$$



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Solve the Compound Inequalities

Then rewrite in interval notation.

$$50 < 4x + 30 < 66$$

$$\begin{array}{ccc} -30 & -30 & -30 \\ \hline 20 & & 36 \end{array}$$

$$\begin{array}{ccc} 20 & & 36 \\ \hline 4 & & 4 \end{array}$$

$$5 < x < 9$$

$$(5, 9)$$

$$5x < 4 + 9x \text{ or } 7x - 1 < 13$$

$$\begin{array}{ccc} -9x & -9x & \\ \hline -4x & & 4 \end{array}$$

$$\begin{array}{ccc} -4x & & 4 \\ \hline -4 & & -4 \end{array}$$

$$x > -1$$

$$(-1, \infty)$$

$$(-\infty, \infty)$$

$$\begin{array}{ccc} +1 & +1 & \\ \hline 7x & & 14 \end{array}$$

$$\begin{array}{ccc} 7x & & 14 \\ \hline 7 & & 7 \end{array}$$

$$x < 2$$

$$(-\infty, 2)$$

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Writing an Interval

The tide in a certain bay fluctuates between 5 feet above the average water level and 5 feet below the average water level. A boat in the bay has a deck that is 12 feet above the water. Its mast stands on the deck 15 feet high. How far above the normal water level could the top of the mast possibly be?

$$22 \leq x \leq 32$$

Oct 6-8:47 PM