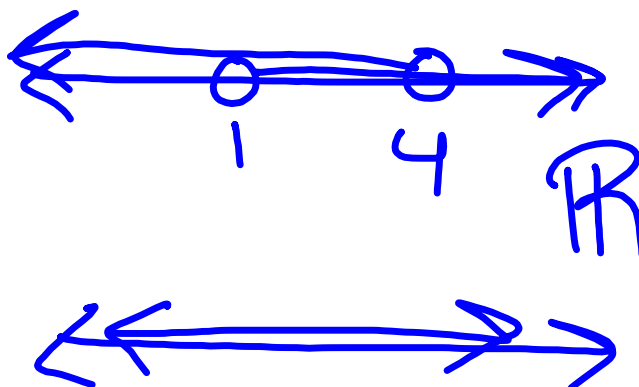


Warm Up:

Graph the compound inequality  $x < 2$  AND  $x > 6$ .  $\emptyset$



Graph the compound inequality  $x > 1$  OR  $x < 4$ .



$$3(k-5) + 9k \geq -3$$

$$\underline{3k} - 15 + \underline{9k} \geq -3$$

$$12k - 15 \geq -3$$

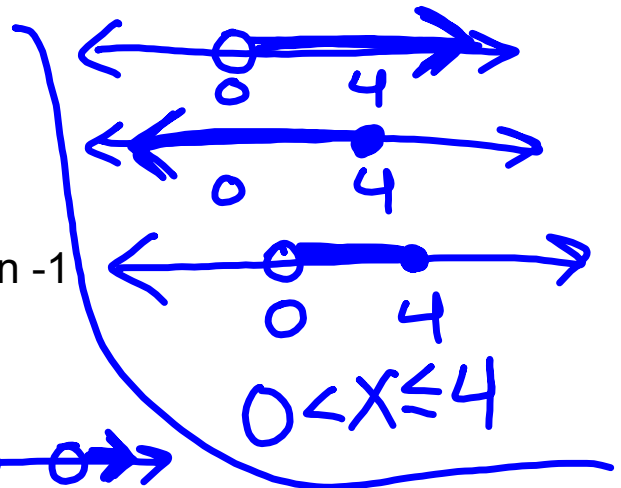
$$12k \geq 12$$

$$k \geq 1$$

Compound inequalities consist of 2 inequalities connected by AND or OR. — one or the other (both graphs combined)  
included in both (overlap)

All real numbers that are greater than zero

and less than or equal to 4.



All real numbers that are less than -1

or greater than 2.



$$0 < x \leq 4$$

**Solving Compound Inequalities with AND**

$$\begin{array}{ccc} -2 \leq 3x-8 \leq 10 \\ +8 \quad \quad +8 \quad \quad +8 \end{array}$$

$$\frac{6}{3} \leq \frac{3x}{3} \leq \frac{18}{3}$$

$$2 \leq x \leq 6$$



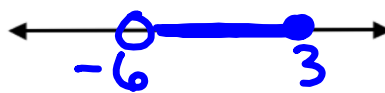
1.  $7 \geq -2x - 5 > 3$

$$\begin{array}{ccc} +5 & +5 & +5 \\ \hline \frac{12}{-2} \geq \frac{-2x}{-2} > \frac{8}{-2} \\ -6 \leq x < -4 \end{array}$$



2.  $4 < \frac{x+6}{3} \leq 7$

$$-6 < x \leq 3$$



3.  $-2 < -\frac{2x}{3} \leq 6$

$$\begin{array}{l} 3 > x \geq -9 \\ -9 \leq x < 3 \end{array}$$



4.  $-16 \leq -6x + 8 \leq 44$

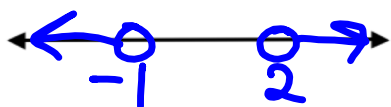
$$\begin{array}{ccc} -8 & -8 & -8 \\ \hline \frac{-24}{-6} \leq \frac{-6x}{-6} \leq \frac{36}{-6} \\ 4 \geq x \geq -6 \end{array}$$





1.  $4x-1 > 7$  or  $5x-1 < -6$

$$x > 2 \text{ or } x < -1$$



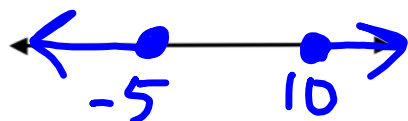
2.  $2x+3 < -1$  or  $3x-5 \leq -2$

$$x < -2 \text{ or } x \leq 1$$



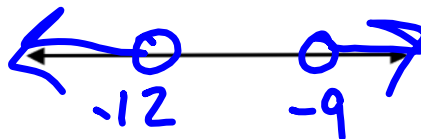
3.  $-3x-7 \geq 8$  or  $-2x-11 \leq -31$

$$x \leq -5 \text{ or } x \geq 10$$



4.  $-3 < x+6$  or  $-\frac{x}{3} > 4$

$$-9 < x \text{ or } x < -12$$



*Solve, graph, and write each inequality in interval notation.*

1.  $4x+1 < 5$  or  $3x-3 > 15$

2.  $7 < 4+x < 8$

3.  $5x-1 \geq 9$  or  $2x-3 \leq -5$

4.  $-1 < 2x+3 \leq 13$

5.  $4 \leq -8-x < 7$

6.  $-4x-2 \geq 18$  or  $-x-3 \leq -13$



