

How do I solve a compound inequality?

There are two types of compound inequalities, the AND problems and the OR problems.

A compound inequality is basically two inequalities that are joined together.

The AND problems

Compound inequalities that contain AND are true only if both statements are true in the solution.

For example: A typical solution to an AND problem looks like this...

$$-3 < x \leq 6$$

The two statements made by this solution are:

1. $x > -3$

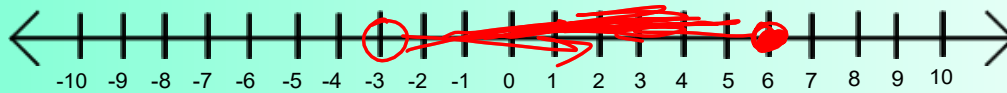
2. $x \leq 6$

Is it possible to find a number, x , that is greater than -3 AND less than or equal to 6 ?

But, how would we graph that?

Lets use the previous example...

$$-3 < x \leq 6$$



So when you graph an AND problem, they should always connect because your solution should be between the two end values.

Lets solve and graph a few...

1. $x + 2 > 12$ and $x + 2 \leq 18$

$$\begin{array}{r} -2 \quad -2 \\ \hline x > 10 \end{array} \quad \& \quad \begin{array}{r} -2 \quad -2 \\ \hline x \leq 16 \end{array}$$

$$\{x \mid 10 < x \leq 16\}$$



2. $3 < 2x - 3 < 15$

$$+3 \quad +3 \quad +3$$

$$\frac{6}{2} < \frac{2x}{2} < \frac{18}{2}$$

$$3 < x < 9$$



3. $-2 \leq 5x + 8 \leq 18$

$$\begin{array}{r} -2 \leq 5x + 8 \\ -8 \quad -8 \end{array} \quad \& \quad \begin{array}{r} 5x + 8 \leq 18 \\ -8 \quad -8 \end{array}$$

$$\frac{-10}{5} \leq \frac{5x}{5}$$

$$\frac{5x}{5} \leq \frac{10}{5}$$

$$-2 \leq x \quad \& \quad x \leq 2$$



4. $2x - 2 \leq 4x - 8 \leq 3x - 3$

5. $2x - 5 < 6x + 7 < 3 + 2x$