

## Compound inequalities with AND

Solve  $x > 3$  and  $x \leq 7$

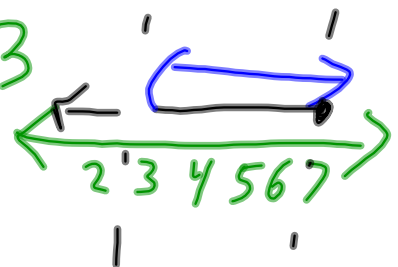
You can combine the two inequalities together

$$3 < x \leq 7$$



$$(3, 7]$$

$$x > 3$$



"and" inequalities are the same as intersection. You find where the solutions overlap (intersect).

$$A \cap B$$

$$-3 < 2x+1 \quad \text{and} \quad 2x+1 \leq 3$$

$$\begin{array}{ccc} -3 < 2x+1 & \leq & 3 \\ -1 & & -1 \\ \hline \end{array}$$

$$\begin{array}{ccc} -4 < 2x & \leq & 2 \\ \frac{-4}{2} & & \frac{2}{2} \\ \hline \end{array}$$

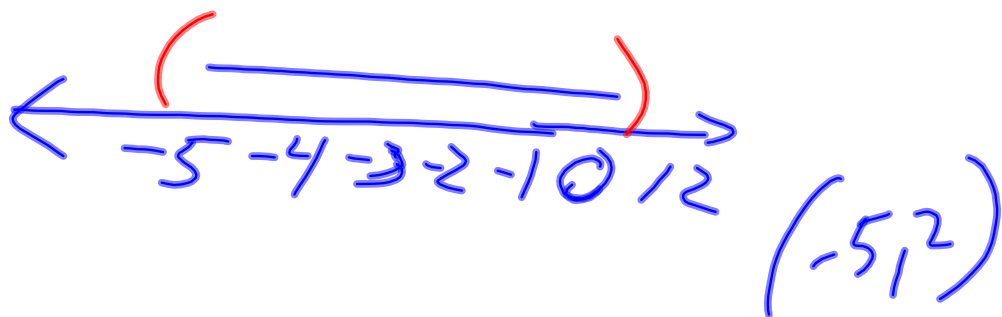
$$-2 < x \leq 1$$

$$-2 < x \quad \text{and} \quad x \leq 1$$

$$(-2, 1]$$



$$\begin{array}{l} -2x < 10 \quad \text{and} \quad -9x > -18 \\ \overline{-2} \quad \overline{-2} \quad \quad \quad \overline{-9} \quad \overline{-9} \\ x > -5 \quad \quad \quad x < 2 \end{array}$$



$$11 < 3y + 2 < 20$$

-2

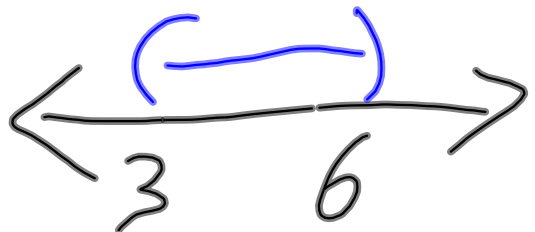
-2

-2

$$\frac{9}{3} < \frac{3y}{3} < \frac{18}{3}$$

(3, 6)

$$3 < y < 6$$



# Compound Inequalities with OR

$$4y - 2 \geq 14 \quad \text{or} \quad 3y - 4 \leq -13$$

solve and graph

$$4y - 2 \geq 14$$

$$+2 \quad +2$$

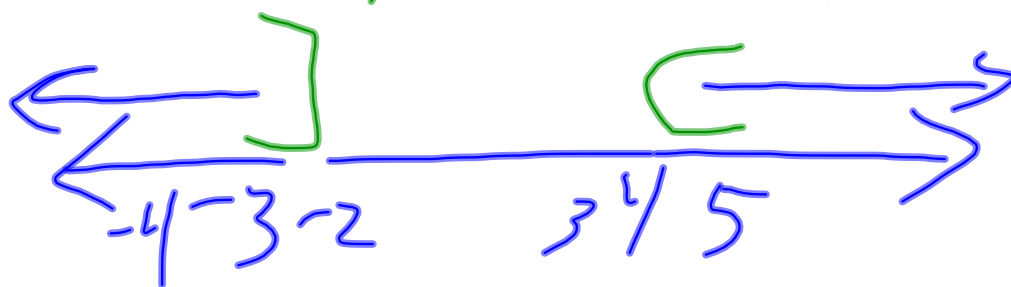
$$4y \geq 16$$

$$y \geq 4 \quad (-\infty, 3) \text{ or } (4, \infty)$$

$$+4 \quad +4$$

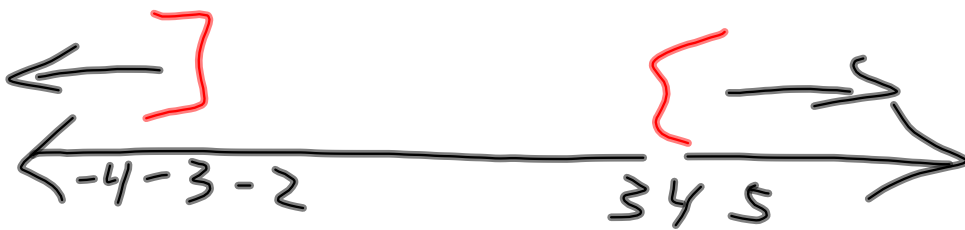
$$3y \leq -9$$

$$y \leq -3$$



$$y \geq 4$$

$$y \leq -3$$



"Or" inequalities are the union of 2 sets. You find the entire solution set.

$$A \cup B$$



