

Graph and solve a  
compound  
inequality with

AND

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OR

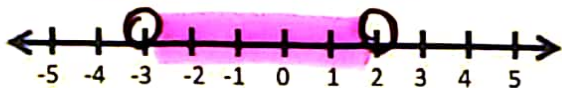
## Write and Graph Compound Inequalities with AND

Example 1:

All real numbers that are greater than -3 and less than 2

$$x > -3 \text{ and } x < 2$$

$$-3 < x < 2$$

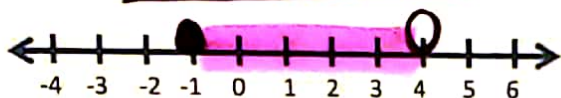


You Try:

All real numbers that are greater than or equal to -1 and less than 4

$$x \geq -1 \text{ and } x < 4$$

$$-1 \leq x < 4$$



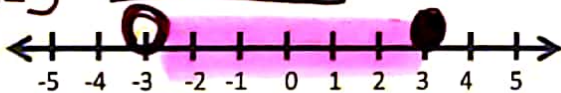
## Solve a Compound inequality with AND

Example 3:

Solve  $-8 < (x - 5) \leq -2$ . Graph the solution.

$$\begin{array}{r} -8 < x - 5 \\ +5 \quad +5 \\ \hline -3 < x \\ x > -3 \end{array} \quad \text{and} \quad \begin{array}{r} x - 5 \leq -2 \\ +5 \quad +5 \\ \hline x \leq 3 \end{array}$$

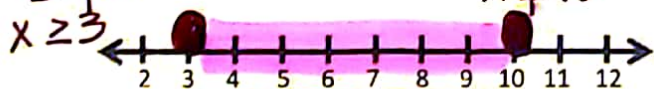
$$-3 < x \leq 3$$



You Try:

Solve  $10 \leq 2x + 4 \leq 24$ . Graph the solution.

$$\begin{array}{r} 10 \leq 2x + 4 \\ -4 \quad -4 \\ \hline 6 \leq 2x \\ \frac{6}{2} \leq \frac{2x}{2} \\ 3 \leq x \\ x \geq 3 \end{array} \quad \text{and} \quad \begin{array}{r} 2x + 4 \leq 24 \\ -4 \quad -4 \\ \hline 2x \leq 20 \\ \frac{2x}{2} \leq \frac{20}{2} \\ x \leq 10 \end{array}$$



$$3 \leq x \leq 10$$

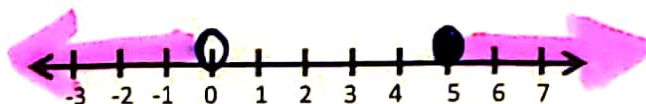
## Write and Graph Compound Inequalities with OR

one or the other  
not both

Example 2:

All real numbers that are less than 0 or greater than or equal to 5

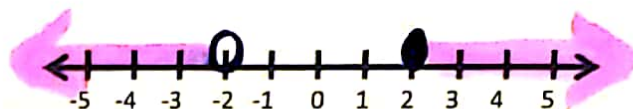
$$x < 0 \text{ OR } x \geq 5$$



You Try:

All real numbers that are less than -2 or greater than or equal to 2

$$x < -2 \text{ OR } x \geq 2$$

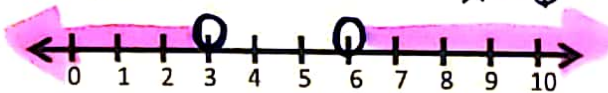


## Solve a Compound inequality with OR

Example 4:

Solve  $2x + 3 < 9$  or  $-3x - 6 < -24$ . Graph the solution.

$$\begin{array}{r} 2x + 3 < 9 \\ -3 \quad -3 \\ \hline 2x < 6 \\ \frac{2x}{2} < \frac{6}{2} \\ x < 3 \end{array} \quad \text{OR} \quad \begin{array}{r} -3x - 6 < -24 \\ +6 \quad +6 \\ \hline -3x < -18 \\ \frac{-3x}{-3} < \frac{-18}{-3} \\ x > 6 \end{array}$$



You Try:

Solve  $4x + 1 \leq -3$  or  $5x - 3 > 17$ . Graph the solution.

$$\begin{array}{r} 4x + 1 \leq -3 \\ -1 \quad -1 \\ \hline 4x \leq -4 \\ \frac{4x}{4} \leq \frac{-4}{4} \\ x \leq -1 \end{array} \quad \text{OR} \quad \begin{array}{r} 5x - 3 > 17 \\ +3 \quad +3 \\ \hline 5x > 20 \\ \frac{5x}{5} > \frac{20}{5} \\ x > 4 \end{array}$$

