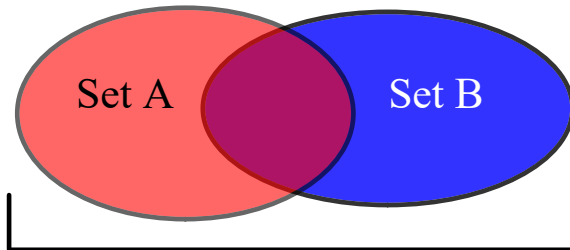


Finding the union of two sets.

The solution set of a compound inequality formed by the word 'or' is the **union** of the solution sets.

It is the values that are true for either of the inequalities.



note: U represents "union"

$A \cup B$

Use the following sets:

$$A = \{1, 2, 3, 4, 5\}$$

$$B = \{3, 4, 5, 6\}$$

$$C = \{x \mid x \text{ is an odd number greater than 0 and less than 9}\}$$

$$D = \{x \mid x \text{ is a whole number less than 5}\} \rightarrow \{0, 1, 2, 3, 4\}$$

a)  $A \cup B$

$$\{1, 2, 3, 4, 5, 6\}$$

b)  $B \cup D$

$$\{0, 1, 2, 3, 4, 5, 6\}$$

c)  $C \cup D$

$$\{0, 1, 2, 3, 4, 5, 7\}$$

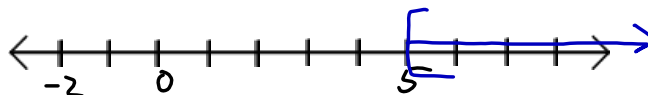
$$\{x \mid x \text{ is a whole number less than 7}\}$$

A value is a solution of a compound inequalities formed by "or" if it is a solution of either inequalities.

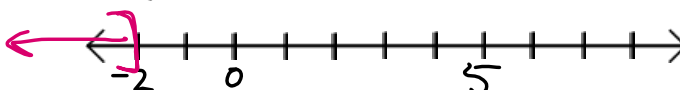
Example:

$$x \geq 5 \text{ or } x \leq -2$$

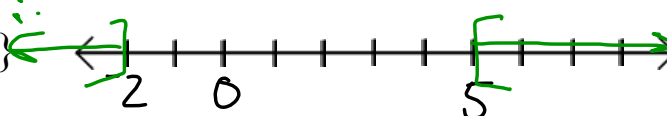
$$\{x | x \geq 5\}$$



$$\{x | x \leq -2\}$$



$$\{x | x \leq -2 \text{ or } x \geq 5\}$$

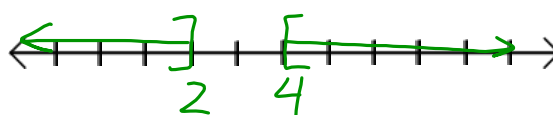


$$(-\infty, -2] \cup [5, \infty)$$

Solve the inequalities. Graph each solution set and write in interval notation:

$$1) 3x - 2 \geq 10 \text{ or } x - 6 \leq -4$$

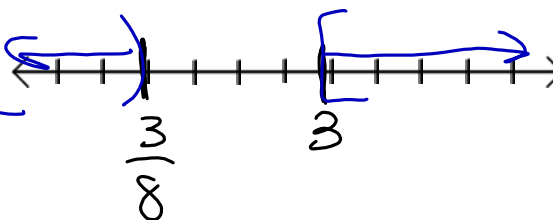
$$\begin{array}{r} +2 \quad +2 \\ \hline 3x \geq 12 \\ \frac{3x}{3} \geq \frac{12}{3} \\ x \geq 4 \end{array} \quad \begin{array}{r} +6 \quad +6 \\ \hline x \leq 2 \end{array}$$



$$(-\infty, 2] \cup [4, \infty)$$

$$2) 16x + 10 < 16 \text{ or } x - 1 \geq 2$$

$$\begin{array}{r} -10 \quad -10 \\ \hline 16x < 6 \\ \frac{16x}{16} < \frac{6}{16} \\ x < \frac{3}{8} \end{array} \quad \begin{array}{r} +1 \quad +1 \\ \hline x \geq 3 \end{array}$$



$$(-\infty, \frac{3}{8}) \cup [3, \infty)$$

Solve the inequalities. Graph each solution set and write in interval notation:

$$3) \quad x - 7 \leq -1 \quad \text{or} \quad 2x - 6 \geq 2$$

$$\begin{array}{r} +7 \quad +7 \\ \hline x \leq 6 \end{array} \quad \begin{array}{r} +6 \quad +6 \\ \hline 2x \geq 8 \\ x \geq 4 \end{array}$$

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

$$4) \quad 5x < -10 \quad \text{or} \quad 3x - 4 \leq 2$$

$$\begin{array}{r} \div 5 \quad \div 5 \\ \hline x < -2 \end{array} \quad \begin{array}{r} +4 \quad +4 \\ \hline 3x \leq 6 \\ x \leq 2 \end{array}$$

$$(-\infty, 2]$$

Solve the inequalities. Graph each solution set and write in interval notation:

$$5) \quad 2(x + 4) < 8 \quad \text{or} \quad -3x - 6 < -18$$

$$\begin{array}{r} 2x + 8 < 8 \\ -8 \quad -8 \\ \hline 2x < 0 \\ \div 2 \quad \div 2 \\ \hline x < 0 \end{array} \quad \begin{array}{r} +6 \quad +6 \\ \hline -3x < -12 \\ \div -3 \quad \div -3 \\ \hline x > 4 \end{array}$$

$$(-\infty, 0) \cup (4, \infty)$$

$$6) \quad -3x - 2 > -8 \quad \text{or} \quad 4x > 0$$

$$\begin{array}{r} +2 \quad +2 \\ \hline -3x > -6 \\ \div -3 \quad \div -3 \\ \hline x < 2 \end{array} \quad \begin{array}{r} \div 4 \quad \div 4 \\ \hline x > 0 \end{array}$$

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

$$(23) \quad 1 - 3x < 4x + 5 \leq x - 5$$

$$1 - 3x < 4x + 5 \quad \text{AND} \quad 4x + 5 \leq x - 5$$

---

$$(24) \quad 4(2 + 3x) \leq 2(x + 2) \leq -3(x - 2)$$

$$4(2 + 3x) \leq 2(x + 2) \quad \text{AND} \quad 2(x + 2) \leq -3(x - 2)$$

SOLVE