2.6 Set Operations & Compound Inequalities

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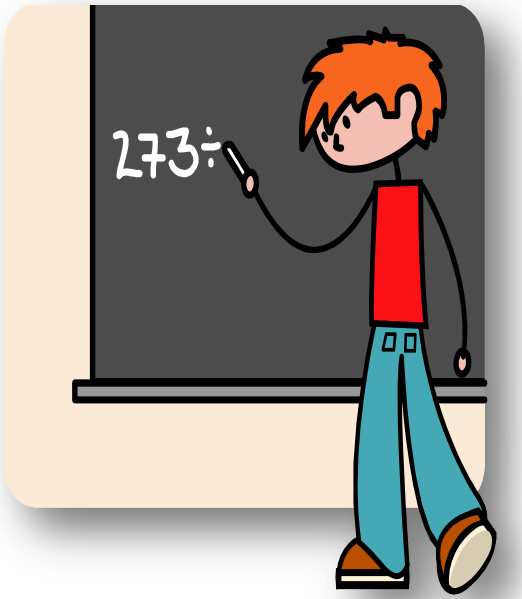


Objectives:

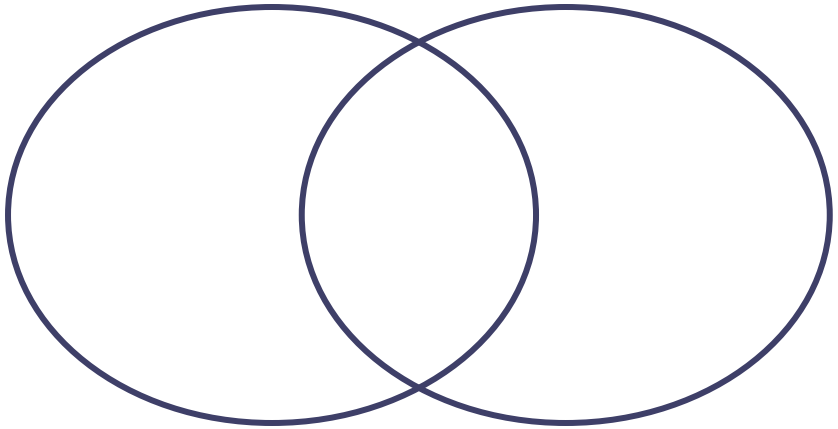
- **Find the intersection of two sets.**
- **Solve compound inequalities with the word *and.***
- **Find the union of two sets.**
- **Solve compound inequalities with the word *or.***

Intersection & Union of Sets

$A = \{1, 2, 3\}$ and $B = \{2, 3, 4\}$

Find:

$A \cap B$ $A \cup B$



Example 1

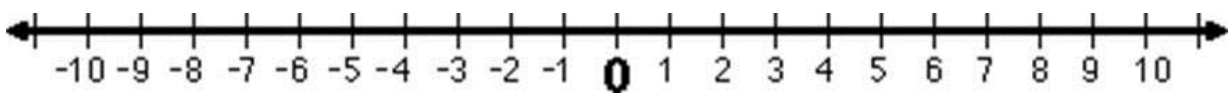
- Find $A \cup B$ and $A \cap B$ for the sets $A = \{3, 4, 5, 6\}$ and $B = \{5, 6, 7\}$.

- **Compound Inequality –**
  - **And**
  - **Or**

Example 2

- Solve the compound inequality and graph the solution set.

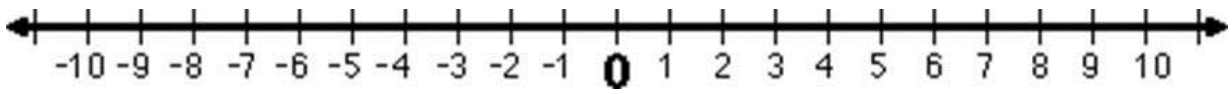
$$x + 3 > 1 \quad \boldsymbol{and} \quad x + 5 \leq 9$$



Example 3

- Solve the compound inequality and graph the solution set.

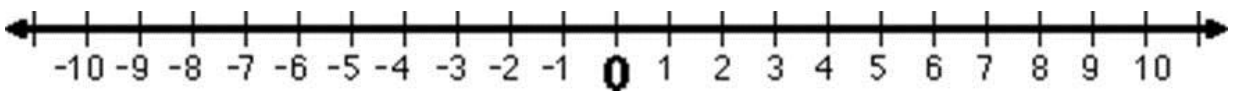
$$2x \leq 4x - 12 \quad \textbf{\textit{and}} \quad 3x \geq 9$$



Example 4

- Solve the compound inequality and graph the solution set.

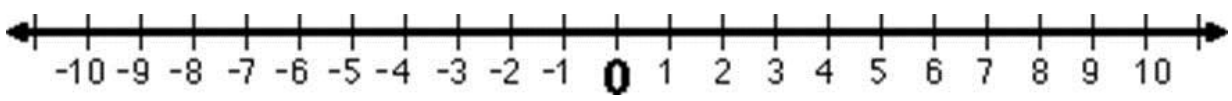
$$x + 2 > 3 \quad \textbf{\textit{and}} \quad 2x + 1 < -3$$



Example 5

- Solve the compound inequality and graph the solution set.

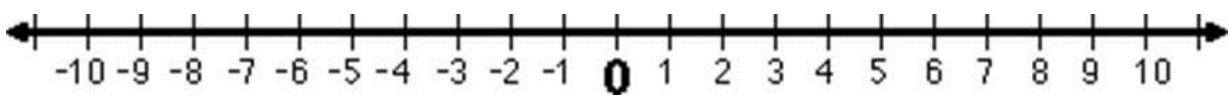
$$x - 1 > 2 \quad \textbf{\textit{or}} \quad 3x + 5 < 2x + 6$$



Example 6

- Solve the compound inequality and graph the solution set.

$$3x - 2 \leq 13 \quad \textbf{\textit{or}} \quad x + 5 \leq 7$$



Example 7

- Solve the compound inequality and graph the solution set.

$$-2x + 5 \geq 11 \quad \textbf{\textit{or}} \quad 4x - 7 \geq -27$$