

Compound Sentences

When two inequalities are combined into one statement, the result is called a **compound inequality**. The words **and** and **or** are used to describe the relationship between the two parts of the inequality.

A compound sentence containing **and** is true only if both inequalities are true.

The two inequalities $a \geq 34$ and $a < 45$ can be written as $34 \leq a < 45$ without **and**. This sentence is read, a is greater than or equal to 34 and less than 45.

Example 1: Write the compound sentence

a) $x > -5$ and $x < 1$ without **and**.

$x > -5$ and $x < 1$ can be written $-5 < x < 1$ or $1 > x > -5$.

b) $y \geq 0$ and $y \leq 5$ without **and**.

$y \geq 0$ and $y \leq 5$ can be written $0 \leq y \leq 5$ or $5 \geq y \geq 0$.

The graph of a compound sentence containing **and** is the **intersection** of the graphs of the two inequalities.

A compound sentence may contain **or** instead of **and**. Only one inequality in such a sentence needs to be true for the sentence to be true. The solution of an **or** sentence is the **union** of the solution sets of each inequality.