Concepts and Formulas

Mathematical Reasoning

Negation of a statement

The denial of a statement is called the negation of the statement. In other words, if p is a statement, then the negation of p is also a statement and is denoted by ~ p, and read as 'not p'.

While forming the negation of a statement, phrases like, "It is not the case" or "It is false that" are also used.

Let us consider the statement:

p: Bangalore is a city.

The negation of this statement is

~p: It is not the case that Bangalore is a city

This can also be written as

~p: It is false that Bangalore is a city.

This can simply be expressed as

~p: Bangalore is not a city

These are the different ways to write the negation of a given sentence.

Compound statements

A Compound Statement is a statement that is made up of two or more statements. In this case, each statement is called a **component statement** .

The word "And"

We have the following rules about the connective word "And"

- The compound statement with 'And' is true if all its component statements are true.
- The component statement with 'And' is false if any of its component statements are false (this includes the case that some of its component statements are false or all of its component statements are false).

The word "Or"

Rules for the compound statement with 'Or'

- A compound statement with an 'Or' is true when one component statement is true or both are true.
- A compound statement with an 'Or' is false when both the component statements are false.