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PROPOSITIONAL LOGIC

The propositional calculus[a] is a branch of logic. It is also called propositional logic, statement logic, sentential calculus, sentential logic, or sometimes zeroth-order logic. It deals with propositions (which can be true or false)[6] and relations between propositions, including the construction of arguments based on them. Compound propositions are formed by connecting propositions by logical connectives representing the truth functions of conjunction, disjunction, implication, biconditional, and negation. Some sources include other connectives, as in the table below.

Unlike first-order logic, propositional logic does not deal with non-logical objects, predicates about them, or quantifiers. However, all the machinery of propositional logic is included in first-order logic and higher-order logics. In this sense, propositional logic is the foundation of first-order logic and higher-order logic.

Propositional logic is typically studied with a formal language, in which propositions are represented by letters, which are called propositional variables. These are then used, together with symbols for connectives, to make compound propositions. Because of this, the propositional variables are called atomic formulas of a formal zeroth-order language. While the atomic propositions are typically represented by letters of the alphabet, there is a variety of notations to represent the logical connectives. The following table shows the main notational variants for each of the connectives in propositional logic.