Modus Ponens Encyclopedia Article

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Modus Ponens

Modus ponens (*MP*) is one of the simplest rules of **inference**. The term is Latin, and means "way of affirming."

Given a set of true **propositions**, we use rules of inference to find out what other propositions must also be true. For instance, when we assume the **truth** of **Euclid's axioms**, we can infer the truth of other geometrical propositions such as the **Pythagorean Theorem**.

MP tells us that if a conditional proposition (a proposition of the form "if A, then B"), and its antecedent (the statement preceded by 'if' in the conditional proposition, i.e., A) are true, we can deduce the truth of its consequent (the statement followed by 'then' in the conditional, i.e., B).

MP can be illustrated by a simple example. Consider the statements: "If Timothy is a cat, then Timothy is an animal," and "Timothy is a cat." By the rule of *modus ponens*, we can infer that Timothy is an animal.

Systems of logic (there are many different logics), like other areas of mathematics, are constructed by choosing a minimal number of simple, fundamental axioms whose truth is considered beyond question. However, given only axioms, one cannot derive any other true statements unless one also accepts the validity of a rule of inference as axiomatic. Using such a rule one can then derive other propositions from the axioms, and if the rule is followed accurately, these new statements are called theorems. Other rules of inference can then be derived and considered theorems of that logic. *Modus ponens* is fairly easy to understand, and seems intuitively to be "common sense." Therefore, when logicians construct systems of logic, they often choose *MP* as their first, unquestionable rule of inference, using it and their postulated axioms to derive theorems as well as other rules of inference such as transitivity or *modus tollens*.