

Logical Deduction Tips

Logical Deduction:

The phenomenon of deriving a conclusion from a single proposition or a set of given propositions, is known as **logical deduction**. The given propositions are also referred to as the **premises**.

Two Inferential Processes of Deduction:

I. Immediate Deductive Inference:

Here, conclusion is deduced from one of the given propositions, by any of the three ways -conversion, obversion and contraposition.

1. Conversion: The Conversion proceeds with interchanging the subject term and the predicate term i.e. the subject term of the premise becomes the predicate term of the conclusion and the predicate term of the premise becomes the subject of the conclusion. The given proposition is called convertend, whereas the conclusion drawn from it is called its converse.

Table of Valid Conversions

Converted	Converse
A: All S is P Ex. All pins are tops.	I: Some P is S Some tops are pins.
E: No S is P. Ex. No fish is whale.	E: No P is S. No whale is fish.
I: Some S is P. Ex. Some boys are poets.	I: Some P is S. Some poets are boys.
O: Some S is not P.	No valid conversion

Note that in a conversion, the quality remains the same and the quantity may change.

2. Obversion: In obversion, we change the quality of the proposition and replace the predicate term by its complement.

Table of Valid Obversions

Proposition	Contrapositive
A: All birds are mammals.	A: All non-mammals are non-birds.
I: Some birds are mammals.	I: Some non-mammals are non-birds.

Note: The valid converse, obverse or contrapositive of a given proposition always logically follows from the proposition.

II. Mediate Deductive Inference (SYLLOGISM): First introduced by Aristotle, a Syllogism is a deductive argument in which conclusion has to be drawn from two propositions referred to as the premises.

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Example:

1. All lotus are flowers.
2. All flowers are beautiful.
3. All lotus are beautiful.

Clearly, the propositions 1 and 2 are the premises and the proposition 3, which follows from the first two propositions, is called the conclusion.

Term: In Logic, a **term** is a word or a combination of words, which by itself can be used as a subject or predicate of a proposition.

Syllogism is concerned with three terms :

- 1. Major Term:** It is the predicate of the conclusion and is denoted by P (first letter of 'Predicate').
- 2. Minor Term:** It is the subject of the conclusion and is denoted by S (first letter of 'Subject').
- 3. Middle Term:** It is the term common to both the premises and is denoted by M (first letter of 'Middle').

Example:

Premises:

1. All dogs are animals.
2. All tigers are dogs.

Conclusion:

All tigers are animals.

Here 'animals' is the predicate of the conclusion and so, it is the major term. P.

'Tigers' is the subject of the conclusion and so, it is the minor term, S.

'Dogs' is the term common to both the premises and so, it is the middle term, M.

Major And Minor Premises : Of the two premises, the major premise is that in which the middle term is the subject and the minor premise is that in which the middle term is the predicate.