

## What Logic Is

Logic is the study of the methods and principles used to distinguish correct from incorrect reasoning.

When we reason about any matter, we produce arguments to support our conclusions. Our arguments include reasons that we think justify our beliefs.

However, not all reasons are good reasons.

Therefore we may always ask, when we confront an argument: Does the conclusion reached follow from the premises assumed? To answer this question there are objective criteria; in the study of logic we seek to discover and apply those criteria.

Reasoning is not the only way in which people support assertions they make or accept. They may appeal to authority or to emotion, which can be very persuasive, or they may rely, without reflection, simply on habits. However, when someone wants to make judgments that can be completely relied upon, their only solid foundation

will be correct reasoning. Using the methods and techniques of logic—one can distinguish reliably between sound and faulty reasoning.

## 2 Propositions and Arguments

We begin by examining more closely the most fundamental concepts in the study of logic, concepts presupposed in the paragraphs just above. In reasoning we construct and evaluate arguments; arguments are built with propositions. Although these concepts are apparently simple, they require careful analysis.

### A. Propositions

Propositions are the building blocks of our reasoning. A proposition asserts that something is the case or it asserts that something is not. We may affirm a proposition, or deny it—but every proposition either asserts what really is the case, or it asserts something that is not. Therefore every proposition is either true or false.

### B. Arguments

With propositions as building blocks, we construct arguments. In any argument we affirm one proposition on the basis of some other propositions. In doing this, an inference is drawn. Inference is a process that may tie together a cluster of propositions. Some inferences are warranted (or correct); others are not. The logician analyzes these clusters, examining the propositions with which the process begins and with which it ends, as well as the relations among these propositions.

Such a cluster of propositions constitutes an argument. Arguments are the chief concern of logic.

Argument is a technical term in logic. It need not involve disagreement, or controversy. In logic, argument refers strictly to any group of propositions of which one is claimed to follow from the others, which are regarded as providing support for the truth of that one. For every possible inference there is a corresponding argument.

In writing or in speech, a passage will often contain several related propositions and yet contain no argument. An argument is not merely a collection of propositions; it is a cluster with a structure that captures or exhibits some inference. We describe this structure with the terms conclusion and premise. The conclusion of an argument is the proposition that is affirmed on the basis of the other propositions of the argument. Those other propositions, which are affirmed (or assumed) as providing support for the conclusion, are the premises of the argument.

## 8 rules for the categorical syllogism

For the categorical syllogism the logicians have formulated eight rules,

**Syllogisms** are arguments which consist of three propositions which are so related so that when the first two propositions (that is, premises) are posited as true the third proposition (that is, the conclusion) must also be true. In other words, a syllogism is an argument arranged in a specific

manner in such a way that it contains a major premise, minor premise, and a conclusion.

The major term is the predicate of the conclusion, while the minor term is the subject of the conclusion. The middle term is the remaining term which does not (and cannot) appear in the conclusion.

### **Rules of Syllogism**

Now that we have presented the key concepts in arguments or syllogisms, let us proceed to the determination of their validity. Logicians have formulated eight (8) rules of syllogism, but of course they can be expanded to 10 or reduced to 6. But let us follow what logicians commonly used, that is, the 8 rules of syllogism. It must be noted that all of the 8 rules of syllogism must be met or satisfied for the argument or syllogism to be valid. If at least one of the 8 rules of syllogism is violated, then the argument or syllogism is invalid.

The 8 rules of syllogism are as follow:

1. **There should only be three terms in the syllogism, namely: the major term, the minor term, and the middle term.** And the meaning of the middle term in the first premise should not be changed in the second premise; otherwise, the syllogism will have 4 terms.
2. **The major and the minor terms should only be universal in the conclusion if they are universal in the premises.** In other words, if the major and the minor terms are universal in the conclusion, then they must also be universal in the premises for the argument to be valid. Hence, if the major and minor terms are particular in the conclusion, then rule #2 is not applicable.
3. **The middle term must be universal at least once.** Or, at least one of the middle terms must be universal.
4. **If the premises are affirmative, then the conclusion must be affirmative.**
5. **If one premise is affirmative and the other negative, then the conclusion must be negative.**
6. **The argument is invalid whenever the premises are both negative.** This is because we cannot draw a valid conclusion from two negative premises.
7. **One premise at least must be universal.**
8. **If one premise is particular, then the conclusion must be particular.**

Now, let us apply these 8 rules of syllogism to the arguments below. Let us color the terms to avoid confusion. So, let us assign the color red for the major term, blue for the minor term, and purple for the middle term.

Rule #1 of the 8 rules of syllogism: There should only be three terms in the syllogism, namely: the major term, the minor term, and the middle term.