

# Logic: It's Truth and Validity| Philosophy

The term logic is derived from the Greek word 'logos' which means thought or reason and language or expression. Logic is the study of the methods and principles used to distinguish good (correct) from bad (incorrect) reasoning. The logician is concerned primarily with the correctness of the completed process of reasoning. The central problem of logic is the distinction between correct and incorrect reasoning

The most important question in connection with reasoning is the question of truth or falsity. Logic being concerned with reasoning must, therefore, deal with the nature and conditions of truth. Truth and falsehood may be predicated of propositions, but never of arguments. And the attributes of validity and invalidity can belong only to deductive arguments, never to propositions. There is a connection between the validity or invalidity of an argument and the truth or falsehood of its premisses and conclusions, but the connection is by no means a simple one.

It is important to realize that an argument may be valid while one or more of its premisses is untrue. Arguments may exhibit differing combinations of true and false premisses and conclusions.

**Some valid arguments contain only true propositions, as, for example:**

All men are mortal,

All students are men,

Therefore, all students are mortal.

Some valid argument contain entirely false proposition, as, for example:

All ten-legged creatures have wings,

All spiders have ten legs,

Therefore, all spiders have wings.

This argument is valid because, if its premisses were true, its conclusion would have to be true also, even though in fact, they are all false.

Moreover, an argument may have premisses that are all true and may have a true conclusion and may nevertheless be invalid, as in the following example:

If the mining industry were in a sound condition the miners and the mine owners would be contented. The mining industry is not in a sound condition. Therefore the miners and the mine owners are not contented.

Arguments with false premisses and true conclusions may be valid or invalid. Here is an example of a valid argument with false premisses and a true conclusion:

All fishes are mammals.

All whales are fishes.

Therefore all whales are mammals.

And here is an example of an invalid argument with false premisses and a true conclusion:

All mammals have wings. All whales have wings. Therefore all whales are mammals.

Finally, there are invalid arguments whose premisses and conclusions are all false, as, for example:

All mammals have wings.

All whales have wings.

Therefore all mammals are whales.

It is clear from the above examples that there are valid arguments with false conclusions as well as invalid arguments with true conclusions. Hence, it is clear that the truth or falsity of an argument's conclusion does not by itself determine the validity or invalidity of that argument. And the fact that an argument is valid does not guarantee the truth of its conclusion.

If an argument is valid, and its conclusion is false, not all its premisses can be true. And also, if an argument is valid and its premisses are true, we may be certain that its conclusion must be true also. Some perfectly valid arguments do have false conclusions. Such an argument must have at least one false premiss.

When an argument is valid, and all of its premisses are true, we call it 'sound'. The conclusion of a sound argument obviously must be true. If a deductive argument is not sound, either it is not valid or not all of its premisses are true, it fails to establish the truth of its conclusion, even if the conclusion is true.

To test the truth or falsehood of premisses is the task of science in general, since premisses may deal with any subject matter at all. The logician is not so much interested in the truth or falsehood of propositions as in the logical relations between them.

By the 'logical' relations between propositions, we mean those relations that determine the correctness or incorrectness of the arguments in which they occur. The logician is interested in the correctness even of arguments whose premisses may be false.

There might be a suggestion that we ought to confine ourselves to arguments that have true premisses, ignoring all others. But as a matter of fact, we are interested in, and must often depend on, the correctness of arguments whose premisses are not known to be true. Examples of such situations suggest themselves readily.

A scientist who is interested in verifying scientific theories by deducing testable consequences from them does not know beforehand which theories are true. Were that known, there would be no need for further verification. In our everyday affairs, we must often choose between alternative courses of action.

Where these courses are genuine alternatives that cannot all be adopted, we may try to reason about which should be chosen. Such reasoning generally involves figuring out the consequences of each of the different actions among which we must choose.

One might argue, "Suppose I choose the first alternative, then such and such will be the case. On the other hand, assuming that I choose the second alternative, then something else will follow". In general, we are inclined to choose among alternative courses of action on the basis of which set of consequences we prefer.

In each case, we are interested in reasoning correctly, rest we decide ourselves. Were we interested only in arguments that have true premisses, we should not know which line of argument to consider until we knew which of the alternative premisses was true.

And if we knew which premiss was true, we should not be interested in the arguments at all, because our purpose in considering the arguments was to help us decide which alternative premisses to make true. To confine our attention to arguments with true premisses alone would be self-defeating and stultifying.

So far, we have discussed only about propositions and arguments that contain them as 'premisses' and 'conclusion'. However, these are not linguistic entities such as sentences, but what sentences may be used to assert.

Whether the actual process of thinking or reasoning requires language or not is an open question. It may be that, thinking requires the use of symbols of some sort: words or images or what not. It is obvious that the communication of any proposition or any argument requires symbols and involves language.

The use of language, however, complicates our problem. Certain accidental or misleading features of their formulations in language may make more difficult the task of investigating the logical relations among propositions. It is part of the task of the logician, therefore, to examine language itself, primarily from the point of view of discovering and describing those aspects of it that tend to obscure the difference between correct and incorrect argument.