

Inductive and Deductive Reasoning

According to traditional logic, arguments can be either inductive or deductive. Sometimes, it is difficult to determine which category an argument might be in. However, there are some key concepts that give clues as to which type the argument is. Generally speaking, deductive arguments are ones wherein the conclusion validly follows from the premises. The most important form of a deductive argument is that of the syllogism.

In deductive argumentation, the conclusion is a proposition that follows from other propositions. This means that the conclusion is supported by the other propositions, called premises. It is incorrect to suggest, however, that this support is weak. Rather, the conclusion must be affirmed if the premises are true; it is impossible for the premises to be true and for the conclusion to be false. The purpose of the premises is to establish the truth of the conclusion.

For example:

All humans are mortal.
John Smith is human.
Therefore, John Smith is mortal.

This example is a simple valid deductive argument because the conclusion is necessarily drawn from the premises. If the truth of the premises is admitted, then the conclusion must also be admitted as true.

Some statements that look like the above example are not necessarily valid deductive arguments. Valid ones follow certain rules of reasoning.

For example:

Some dogs are ill-behaved.
All dogs are animals.
Therefore, all animals are ill-behaved.

This is an invalid deductive argument. It might appear the same as the one previously written, however it breaks certain logical rules. (Experience tells us that there are animals that **are not** ill-behaved.)

Deductive reasoning does not grant new knowledge, but instead clarifies concepts that we may already know something about. Even though deduction aims at producing true, valid conclusions, it does so only based on prior knowledge of the truth of its premises. If one of the premises is false, the conclusion will be false.

Name _____

Date _____

Inductive and Deductive Reasoning (Cont'd)

Inductive reasoning does not aim at producing true, valid conclusions. In fact, “valid” and “invalid” are not terms that can be accurately applied to inductive reasoning. Inductive reasoning enables us to infer probable and likely conclusions. Inductive reasoning is useful for gaining new knowledge by understanding statistical patterns and also for identifying causes and effects. However, unlike deductive argument, inductive arguments cannot guarantee true conclusions even if their premises are true. Two of the most common types of inductive argument are the analogy and the statistical.

It is important to understand that inductive reasoning attempts to predict or suggest its conclusion based on inferences on the premises, but there is no necessity for the conclusion to follow from the premises. In other words, there is no guarantee that the future will be like the past or that the conclusion will definitely be true.

Name _____

Date _____

Inductive and Deductive Reasoning Questions

Fill Ins:

1. _____ arguments are ones wherein the conclusion validly follows from the premises.
2. The most important form of deductive argument is that of the _____.
3. Two of the most common types of inductive argument are the _____ and the _____.

True or False:

- ___ 4. Conclusions based on inductive reasoning will always be true.
- ___ 5. Deductive reasoning does not grant new knowledge, but instead clarifies concepts that we may already know something about.
- ___ 6. If one of the premises is false, the conclusion will be false.

Do the following use inductive or deductive reasoning (write "I" for inductive and "D" for deductive):

- ___ 7. All cats have fur.
Xena is a cat.
Therefore, Xena has fur.
- ___ 8. Some horses are big.
All horses have tails.
Therefore, anything with a tail is big.
- ___ 9. All humans have a nose.
Bobby is human.
Therefore, Bobby has a nose.

Name _____

Date _____

Inductive and Deductive Reasoning Answers

Fill Ins:

4. Deductive arguments are ones wherein the conclusion validly follows from the premises.
5. The most important form of deductive argument is that of the syllogism.
6. Two of the most common types of inductive argument are the analogy and the statistical.

True or False:

- F 4. Conclusions based on inductive reasoning will always be true.
- T 5. Deductive reasoning does not grant new knowledge, but instead clarifies concepts that we may already know something about.
- T 6. If one of the premises is false, the conclusion will be false.

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