What is Logic?

Worksheet

Logic is the systematic study of correct reasoning, distinguishing valid arguments (where the conclusion must follow from the premises) from invalid or fallacious ones.

Questions

1. Which best defines a valid deductive argument?

A) One with true premises
B) One where the conclusion must follow from the premises
C) One that persuades most people
D) One based on statistics

2. 'All cats are mammals. Fluffy is a cat. Fluffy is a mammal.' What type of reasoning is this?

A) Inductive
B) Deductive
C) Abductive
D) Circular

3. A valid argument with a false premise is:

A) Automatically sound
B) Still possibly unsound
C) Impossible
D) Always inductive

4. Attacking a person instead of their argument is called:

A) Straw man
B) Ad hominem
C) False dilemma
D) Slippery slope

5. Evaluate this argument: 'All birds can fly. Penguins are birds. Therefore, penguins can fly.' Is it valid or sound?

6. Classify this reasoning: 'The sun has risen every day of recorded history, so it will rise tomorrow.'

7. Identify the fallacy: 'You're wrong about climate change because you're not a scientist.'

8. Define: What is a valid argument?

9. Define: What is a sound argument?

10. Define: Deductive vs inductive reasoning?

Answer Key

1. B) One where the conclusion must follow from the premises - Validity is about logical structure, not the truth of the premises.

2. B) Deductive - It moves from general premises to a guaranteed specific conclusion - deductive.

3. B) Still possibly unsound - Validity concerns structure; soundness also requires true premises, so a false premise makes it unsound.

4. B) Ad hominem - Ad hominem targets the person, not the argument's content.

5. The argument is logically VALID - the conclusion follows the form (All A are B; C is A; so C is B). But it is NOT SOUND, because the first premise 'All birds can fly' is factually false (penguins can't fly). A valid argument with a false premise can still have a false conclusion.

6. This moves from many specific observations to a general prediction - this is INDUCTIVE reasoning. Unlike deduction, the conclusion is highly probable but not logically certain. Inductive arguments are evaluated by strength, not validity.

7. This attacks the arguer's credentials instead of the argument's content. This is the fallacy of AD HOMINEM (attacking the person). The truth of a claim doesn't depend on who states it.

8. An argument where, if the premises are true, the conclusion must be true - the logical structure guarantees it.

9. A valid argument whose premises are actually true. Sound = valid + true premises.

10. Deductive moves from general to specific with certainty; inductive moves from specific to general with probability.