

Fundamentals of Formal Logic

Logic · Answer Key · 8 Questions

1. Which ancient Greek philosopher is credited with the development of the syllogism, a foundational form of deductive reasoning?

- A) Plato
- B) Socrates
- C) Aristotle**
- D) Epicurus

2. In propositional logic, what is the specific name for the rule of inference where 'If P implies Q, and P is true, then Q must be true'?

- A) Modus Ponens**
- B) Modus Tollens
- C) Reductio ad absurdum
- D) Disjunctive syllogism

3. Which 19th-century mathematician introduced the concept of the truth table and established the foundations of Boolean algebra?

- A) Kurt Gödel
- B) George Boole**
- C) Bertrand Russell
- D) Gottlob Frege

4. What is the name of the theorem that states that in any consistent formal system containing basic arithmetic, there are statements that cannot be proven or disproven within that system?

- A) Church-Turing Theorem
- B) Banach-Tarski Theorem
- C) Gödel's Incompleteness Theorem**
- D) The Law of Excluded Middle

5. Which logical principle states that for any proposition, either that proposition is true or its negation is true?

- A) Law of Identity
- B) Law of Non-Contradiction
- C) Law of Excluded Middle**
- D) Principle of Sufficient Reason

6. In formal logic, what is the term for a statement that is true under every possible interpretation?

- A) Contingency
- B) Tautology**
- C) Contradiction
- D) Satisfiability

7. Which influential work, co-authored by Alfred North Whitehead and Bertrand Russell, attempted to derive all mathematical truths from purely logical axioms?

- A) Principia Mathematica**
- B) The Laws of Thought
- C) Begriffsschrift
- D) Tractatus Logico-Philosophicus

8. What logical fallacy involves attacking the character of an opponent rather than addressing the substance of their argument?

- A) Straw Man
- B) Post hoc ergo propter hoc
- C) Ad hominem**
- D) False dilemma