

Foundations of Formal Logic

Logic · Answer Key · 8 Questions

1. Who is credited with creating the first formal system of deductive reasoning, known as the syllogism, in his work 'Prior Analytics'?

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

2. In 1854, which mathematician published 'An Investigation of the Laws of Thought', effectively founding the field of algebraic logic?

- A) Gottlob Frege
- B) George Boole**
- C) Augustus De Morgan
- D) Bertrand Russell

3. What is the name of the seminal three-volume work published by Alfred North Whitehead and Bertrand Russell that attempted to derive all mathematical truths from logical axioms?

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

4. Which logician proved the incompleteness theorems in 1931, demonstrating that in any consistent formal system, there are statements that cannot be proven or disproven?

- A) Alan Turing
- B) David Hilbert
- C) Kurt Gödel**
- D) Alfred Tarski

5. What early computational device, designed by Charles Babbage in the 19th century, was intended to automate logical calculations?

- A) The Difference Engine
- B) The Analytical Engine**
- C) The Jacquard Loom
- D) The ENIAC

6. Gottlob Frege's 1879 work 'Begriffsschrift' is historically significant for introducing what new logical notation?

A) Quantifier notation

B) Propositional calculus

C) Boolean algebra

D) Set theory notation

7. Who formulated the 'Law of the Excluded Middle' as a fundamental principle of classical logic?

A) Zeno of Elea

B) Aristotle

C) Parmenides

D) Heraclitus

8. Which English logician is known for inventing the graphical method for visualizing syllogisms, known as 'Venn diagrams', in 1880?

A) John Venn

B) Lewis Carroll

C) Charles Sanders Peirce

D) William Stanley Jevons