

## Reasoning Rigor: The Senior Scholar's Logic Quest

Syllogistic validity, nuanced informal fallacies, and Bayesian probability — rigorous evaluation of complex claims to sharpen academic discernment for college readiness.

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**1. In the context of the 'Gambler's Fallacy,' if a fair coin has landed on heads five times in a row, what is the logically sound evaluation of the next flip?**

- A. Tails is 'due' because of the law of averages.
- B. The probability remains 0.5 for heads and 0.5 for tails.
- C. The probability of tails has increased to roughly 75%.
- D. The sequence is now biased, making another heads more likely.

**2. An argument can be logically valid even if all of its premises are factually false.**

- A. True
- B. False

**3. Assess this scenario: A politician argues that we should not listen to a scientist's report on oceanography because the scientist once failed their driving test. This is an example of a(n) \_\_\_\_\_ fallacy.**

- A. Genetic
- B. Ad Hominem Circumstantial
- C. Ad Hominem Abusive
- D. Red Herring

**4. Analyze the following: 'If the treaty is signed, trade will increase. Trade has increased. Therefore, the treaty was signed.' Which formal fallacy is committed?**

- A. Denying the Antecedent
- B. Affirming the Consequent
- C. Non-sequitur
- D. Post Hoc Ergo Propter Hoc

**5. A researcher assumes that because a specific urban neighborhood has a high crime rate, any individual resident from that neighborhood is likely to be a criminal. This error in logic is known as the \_\_\_\_\_.**

- A. Fallacy of Composition
- B. Hasty Generalization
- C. Fallacy of Division
- D. Ecological Fallacy

**6. In formal logic, the law of non-contradiction states that contradictory propositions cannot both be true in the same sense at the same time.**

- A. True

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B. False

**7. Evaluate the strength of this inductive argument: 'Every observed tiger in the wild has stripes. Therefore, the next tiger we see will have stripes.'**

- A. Weak/Unsound
- B. Strong/Cogent
- C. Valid/Sound
- D. Deductive/Certain

**8. In Bayesian reasoning, if you receive new evidence that contradicts an initial hypothesis, you must update your \_\_\_\_\_ probability to reach a posterior probability.**

- A. Hypothetical
- B. Likelihood
- C. Prior
- D. Conditional

**9. Which of the following scenarios best demonstrates the 'Sunk Cost Fallacy'?**

- A. Investing more money into a failing business because you have already invested a million dollars.
- B. Buying a stock because its price has dropped significantly and you hope it rebounds.
- C. Refusing to buy a new car because the old one is still reliable enough.
- D. Selling a profitable investment to realize gains before the market shifts.

**10. A Reification Fallacy occurs when an abstract concept (like 'The Government' or 'Nature') is treated as if it were a concrete, sentient entity with motives.**

- A. True
- B. False