

4. Probability, Random Variables, and Probability Distributions Starter Quiz · 课前小测

AP Statistics

Name: _____ Score: _____

1. Probability is best described as the long-run...
 - ☐ relative frequency of an outcome
 - ☐ guess about the next trial
 - ☐ number of trials
 - ☐ average of the data
2. In a simulation, 12 of 100 trials gave the outcome of interest. Estimate the probability (as a decimal).

3. Rolling a fair die, what is $P(\text{even})$? Give a decimal.

4. $P(A)=0.3$, $P(B)=0.4$, $P(A \text{ and } B)=0.1$. Find $P(A \text{ or } B)$.

5. $P(A \text{ and } B) = 0.2$ and $P(B) = 0.5$. Find $P(A | B)$.

6. Two independent events have $P(A)=0.5$ and $P(B)=0.5$. Find $P(A \text{ and } B)$.

7. The number of heads in 3 coin flips is which kind of random variable?
 - ☐ discrete
 - ☐ continuous
 - ☐ categorical
 - ☐ neither
8. Which is NOT one of the four binomial (BINS) conditions?
 - ☐ the trials must be a random sample of the population
 - ☐ binary outcomes
 - ☐ independent trials
 - ☐ a fixed number of trials

9. After 5 heads in a row on a fair coin, tails is 'due' and more likely on the next flip.

☐ True ☐ False

10. The law of large numbers says that as the number of trials grows, the estimated probability...

- ☐ approaches the true probability
- ☐ becomes exactly 0.5
- ☐ gets less reliable
- ☐ stays fixed forever

4. Probability, Random Variables, and Probability DistributionsAnswers
· 答案

AP Statistics

1. **relative frequency of an outcome**

Probability = long-run relative frequency over many repetitions.

2. **0.12**

Estimate = successes / trials = $12/100 = 0.12$.

3. **0.5**

Even = {2,4,6}, so $3/6 = 0.5$.

4. **0.6**

$0.3 + 0.4 - 0.1 = 0.6$.

5. **0.4**

$P(A|B) = P(A \cap B)/P(B) = 0.2/0.5 = 0.4$.

6. **0.25**

Independent $\rightarrow$ multiply: $0.5 \times 0.5 = 0.25$.

7. **discrete**

It takes countable separate values (0,1,2,3) — discrete.

8. **the trials must be a random sample of the population**

BINS = Binary, Independent, fixed Number, Same p. Random sampling isn't required.

9. **False**

Each flip is independent — chance has no memory. That's the law-of-averages fallacy.

10. **approaches the true probability**

More trials $\rightarrow$ the estimate closes in on the true value.