

1. Probability is best described as the long-run...
 - ☐ number of trials
 - ☐ average of the data
 - ☐ guess about the next trial
 - ☐ relative frequency of an outcome
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. The number of heads in 3 coin flips is which kind of random variable?
 - ☐ neither
 - ☐ categorical
 - ☐ continuous
 - ☐ discrete
7. X wins 5 with prob 0.2, else 0. Find the mean $E(X) = 5(0.2)+0(0.8)$.

8. When subtracting two independent random variables, you subtract their variances.

☐ True ☐ False
9. Which is NOT one of the four binomial (BINS) conditions?
 - ☐ a fixed number of trials
 - ☐ the trials must be a random sample of the population
 - ☐ binary outcomes

10. Which situation is geometric (not binomial)?

- ☐ roll a die until the first six
- ☐ count sixes in 10 rolls
- ☐ correct answers on a 5-question quiz
- ☐ count heads in 20 flips

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. discrete

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

7. 1

$5(0.2) + 0(0.8) = 1$.

8. False

Variances ADD even for a difference – never subtract them.

9. the trials must be a random sample of the population

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

10. roll a die until the first six

'Until the first success' → geometric; fixed n → binomial.