

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

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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).  
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3. Rolling a fair die, what is  $P(\text{even})$ ? Give a decimal.  
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4.  $P(A)=0.3$ ,  $P(B)=0.4$ ,  $P(A \text{ and } B)=0.1$ . Find  $P(A \text{ or } B)$ .  
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5.  $P(A \text{ and } B) = 0.2$  and  $P(B) = 0.5$ . Find  $P(A | B)$ .  
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6. Two independent events have  $P(A)=0.5$  and  $P(B)=0.5$ . Find  $P(A \text{ and } B)$ .  
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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

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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.