

## MATHEMATICS AND STATISTICS — 30 QUESTIONS

Multiple choice · 45 minutes

Work through the questions in order, but do not spend too long on any one. Mark your best answer for every question, then check your work against the worked solutions.

**1. In an experiment, a 4 on a die happened 3 times in 30 trials. What is the experimental probability? Give your answer as a fraction in simplest form.**

- A  $\frac{1}{6}$
- B  $\frac{1}{10}$
- C  $\frac{1}{9}$
- D  $\frac{9}{10}$

**2. What is the value of  $4w + 5$  when  $w = 3$ ?**

- A 48
- B 12
- C 7
- D 17

**3. In an experiment, heads on a coin happened 5 times in 40 trials. What is the experimental probability? Give your answer as a fraction in simplest form.**

- A  $\frac{1}{8}$
- B  $\frac{1}{6}$
- C  $\frac{1}{7}$
- D  $\frac{7}{8}$

## THE WORKED ANSWERS TO THOSE 3 QUESTIONS

1. In an experiment, a 4 on a die happened 3 times in 30 trials. What is the experimental probability? Give your answer as a fraction in simplest form. [Experimental probability]

**Correct answer: B —  $\frac{1}{10}$**

- Experimental probability = number of times the event happened  $\div$  number of trials.
- $\frac{3}{30} = \frac{1}{10}$ .
- Why the other options are wrong:
- A ( $\frac{1}{6}$ ): That is the theoretical probability of a six-sided die, not the result of this experiment.
- C ( $\frac{1}{9}$ ): Compared successes with failures.
- D ( $\frac{9}{10}$ ): That is the probability of the event NOT happening.

*Skill: Experimental probability*

### KEY TAKEAWAY

Experimental probability (relative frequency) = successes  $\div$  trials.

2. What is the value of  $4w + 5$  when  $w = 3$ ? [Substitution]

**Correct answer: D — 17**

- Replace  $w$  with 3:  $4 \times 3 + 5$ .
- $= 17$ .
- Why the other options are wrong:
- A (48): Wrote the digits next to each other instead of multiplying.
- B (12): Added instead of multiplying 4 by  $w$ .
- C (7): Used the wrong sign for 5.

*Skill: Substitution*

### KEY TAKEAWAY

Substitute the value for the letter, then follow the order of operations.

3. In an experiment, heads on a coin happened 5 times in 40 trials. What is the experimental probability? Give your answer as a fraction in simplest form. [Experimental probability]

**Correct answer: A —  $\frac{1}{8}$**

- Experimental probability = number of times the event happened  $\div$  number of trials.
- $\frac{5}{40} = \frac{1}{8}$ .
- Why the other options are wrong:
  - B ( $\frac{1}{6}$ ): That is the theoretical probability of a six-sided die, not the result of this experiment.
  - C ( $\frac{1}{7}$ ): Compared successes with failures.
  - D ( $\frac{7}{8}$ ): That is the probability of the event NOT happening.

*Skill: Experimental probability*

#### KEY TAKEAWAY

Experimental probability (relative frequency) = successes  $\div$  trials.