

MATHEMATICS AND STATISTICS — 30 QUESTIONS

Multiple choice · 50 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. Expand $8x(x - 5)$.

- A $8x^2 - 5$
- B $8x^2 + 40x$
- C $8x - 40x$
- D $8x^2 - 40x$

2. The ages of 12 members of a club are 53, 30, 9, 35, 19, 5, 33, 48, 44, 41, 51, 32. What is the interquartile range (IQR)?

- A 48
- B 34
- C 21.5
- D 22.5

3. A fair spinner has a theoretical probability of $\frac{1}{5}$ for landing on red. In 50 spins it landed on red 3 times. What is the experimental probability of red, as a fraction in simplest form?

- A $\frac{3}{50}$
- B $\frac{47}{50}$
- C $\frac{50}{3}$
- D $\frac{1}{5}$

THE WORKED ANSWERS TO THOSE 3 QUESTIONS

1. Expand $8x(x - 5)$. [Expanding brackets]

Correct answer: D — $8x^2 - 40x$

- Multiply every term inside the bracket by the term outside.
- $8x(x - 5) = 8x^2 - 40x$.
- Why the other options are wrong:
- A ($8x^2 - 5$): Did not multiply the second term by $8x$.
- B ($8x^2 + 40x$): Used the wrong sign.
- C ($8x - 40x$): Multiplied x by x and got x , not x^2 .

Skill: Expanding brackets

KEY TAKEAWAY

Expanding: multiply each term in the bracket by the term outside.

2. The ages of 12 members of a club are 53, 30, 9, 35, 19, 5, 33, 48, 44, 41, 51, 32. What is the interquartile range (IQR)? [Quartiles and the IQR]

Correct answer: C — 21.5

- Put the values in order: 5, 9, 19, 30, 32, 33, 35, 41, 44, 48, 51, 53.
- $Q1 = 24.5$, $Q3 = 46$, so $IQR = 46 - 24.5 = 21.5$.
- Why the other options are wrong:
- A (48): That is the range.
- B (34): That is the median.
- D (22.5): A slip somewhere in the working: this is not the answer (the correct answer is 21.5).

Skill: Quartiles and the IQR

KEY TAKEAWAY

$IQR = Q3 - Q1$: order the data, split it into halves and find the median of each half.

3. A fair spinner has a theoretical probability of $\frac{1}{5}$ for landing on red. In 50 spins it landed on red 3 times. What is the experimental probability of red, as a fraction in simplest form?
[Experimental probability]

Correct answer: A — $\frac{3}{50}$

- Experimental probability = $3 \div 50$.
- = $\frac{3}{50}$.
- Why the other options are wrong:
- B ($\frac{47}{50}$): That is the probability of not landing on red.
- C ($\frac{50}{3}$): Turned the fraction upside down.
- D ($\frac{1}{5}$): That is the theoretical probability.

Skill: Experimental probability

KEY TAKEAWAY

Experimental probability = number of times it happened $\div$ number of trials.