Worked answers | Probability

Expected frequencies

6 questions | 14 marks

Equivalent correct methods earn the corresponding marks.

1. An event has probability $\frac{1}{5}$. Find the expected frequency in 40 trials. [2 marks]

$40 \times \frac{1}{5} = 8$.

Answer: 8.

2. An ideal spinner is half red. Find the expected red count in 90 spins. [2 marks]

Red chance is $\frac{1}{2}$.

$90 \times \frac{1}{2} = 45$.

Answer: 45.

3. A bag has 3 green and 2 white equal-size counters. Each randomly chosen counter is returned and remixed. How many green results are expected in 50 draws? [3 marks]

Returning maintains chance $\frac{3}{5}$.

$50 \times \frac{3}{5} = 30$.

Answer: 30.

4. A fair die is rolled 60 times. How many results greater than 4 are expected? [2 marks]

The favourable faces are 5 and 6: chance $\frac{1}{3}$.

$60 \times \frac{1}{3} = 20$.

Answer: 20.

5. An event has chance $\frac{1}{4}$ and is repeated 10 times. Is an expected frequency of 2.5 a mistake? Explain. [2 marks]

$10 \times \frac{1}{4} = 2.5$.

A predicted average count can be fractional although actual counts are whole.

Answer: No.

6. A fair coin gave 31 heads in 50 tosses instead of the expected 25. Does that alone show the prediction calculation was wrong? [3 marks]

The expected count remains $50 \times \frac{1}{2} = 25$.

31 is one random observed count; expected does not mean guaranteed.

Answer: No.