Probabilities of combined outcomes

6 questions | 14 marks

Equivalent correct methods earn the corresponding marks.

1. A fair coin and standard die are independent. Find $P(\text{head and die greater than } 4)$. [2 marks]

$\frac{1}{2} \times \frac{2}{6} = \frac{1}{6}$.

Answer: $\frac{1}{6}$.

2. A bag has 2 red and 3 blue tokens. Draw at random and replace the token before a second random draw. Find $P(\text{two red})$. [2 marks]

$\frac{2}{5} \times \frac{2}{5} = \frac{4}{25}$.

Answer: $\frac{4}{25}$.

3. Find $P(\text{two heads or two tails})$ for two independent fair coins. [2 marks]

HH or TT gives 2 of 4 outcomes.

Answer: $\frac{1}{2}$.

4. Two independent fair spinners each show 1,2,3. Find $P(\text{sum } 4)$. [3 marks]

Favourable pairs $(1,3),(2,2),(3,1)$ give 3 of 9.

Answer: $\frac{1}{3}$.

5. Find $P(\text{even or greater than } 4)$ for a fair standard die. [2 marks]

Outcomes $\{2,4,5,6\}$ give $\frac{4}{6}$.

Answer: $\frac{2}{3}$.

6. A bag has B1, B2 and G. Draw two tokens at random without replacement. Find $P(\text{both blue})$. [3 marks]

Favourable pairs B1B2 and B2B1 give 2 of 6.

Answer: $\frac{1}{3}$.