Compound-event sample spaces

6 questions | 12 marks

Equivalent correct methods earn the corresponding marks.

1. List the sample space for two fair independent coin tosses. [1 mark]

Keep the first result H for two entries, then T.

Answer: HH, HT, TH, TT.

2. Find $P(\text{two heads})$ for two fair independent coin tosses. [2 marks]

Only HH is favourable out of four.

Answer: $\frac{1}{4}$

3. A fair coin and an independent fair die are used. How many ordered outcomes are possible? [2 marks]

2 coin results times 6 die results gives 12.

Answer: 12

4. For a fair coin and independent fair die, find $P(\text{heads and die greater than } 4)$. [2 marks]

H5 and H6 are favourable among 12 outcomes: $\frac{2}{12}=\frac{1}{6}$.

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

5. An equal spinner labelled A, B, C is spun twice independently. Find $P(\text{same letter})$. [2 marks]

AA, BB and CC are favourable among nine outcomes.

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

6. Explain why zero, one and two heads are not equally likely in two fair independent tosses. [3 marks]

Group HH, HT, TH, TT by head count.

Their probabilities are $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{1}{4}$.

Answer: Exactly one head has two ordered outcomes; zero and two heads have one each.