Compound events

6 questions | 15 marks

Equivalent correct methods earn the corresponding marks.

1. List the complete outcomes for two coin tosses. [2 marks]

Keep first and second toss positions distinct.

Answer: HH, HT, TH, TT.

2. Two fair coins are tossed. Find $P(\text{exactly one head})$. [2 marks]

HT and TH are favourable: $\frac{2}{4}$.

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

3. A fair six-sided die is rolled. Find $P(\text{odd or prime})$. [2 marks]

$\text{Odd} = \{1, 3, 5\},\ \text{prime} = \{2, 3, 5\}$.

$\text{Union} = \{1, 2, 3, 5\}$: $\frac{4}{6}$.

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

4. Two fair dice are rolled. Find $P(\text{sum } 7)$. [3 marks]

There are 36 ordered pairs.

Six pairs sum to 7, giving $\frac{6}{36}$.

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

5. Find $P(\text{at least one } 6)$ on two fair dice. [3 marks]

The complement has neither die equal to 6.

$1 - (\frac{5}{6})^2 = \frac{11}{36}$.

Answer: $\frac{11}{36}$.

6. A fair coin is tossed independently of a fair six-sided die roll. Find $P(\text{head or die shows } 6)$. [3 marks]

Head contributes 6 outcomes, a 6 contributes 2, and (H,6) overlaps.

$\frac{6+2-1}{12} = \frac{7}{12}$.

Answer: $\frac{7}{12}$.