

1 Single events

A spinner lands on red, blue, green or yellow. $P(\text{red}) = 0.35$ and $P(\text{blue}) = 0.2$. Green and yellow are equally likely.

- a) Find $P(\text{green})$.
b) Find $P(\text{not blue})$.

$$\begin{aligned} \text{a) } 1 - 0.55 &= 0.45, 0.45 \div 2 = 0.225 \\ \text{b) } 1 - 0.2 &= 0.8 \end{aligned}$$

2 Relative frequency

A dice shows a 6 on 4 of its first 10 rolls, and on 52 of 300 rolls altogether.

- a) Find both relative frequencies of a 6.
b) Does the dice look biased? Explain.

$$\begin{aligned} \text{a) } \frac{4}{10} &= 0.4, \frac{52}{300} = 0.17 \\ \text{b) no: } 300 \text{ rolls give } 0.17, \text{ close to } \frac{1}{6}; 10 \text{ rolls are too few} \end{aligned}$$

3 Expected outcomes

A game costs 50p to play and a win pays £2. $P(\text{win}) = 0.15$. 200 people play.

- a) How many are expected to win?
b) How much profit should the game expect to make?

$$\begin{aligned} \text{a) } 0.15 \times 200 &= 30 \\ \text{b) } 200 \times 50\text{p} &= \text{£}100 \\ \text{£}100 - 30 \times \text{£}2 &= \text{£}40 \end{aligned}$$

4 Sample space diagrams

Fair spinners A (1, 2, 3) and B (2, 4, 6) are spun and the two scores added.

- a) Find $P(\text{the total is odd})$.
b) Find $P(\text{the total is more than 6})$.

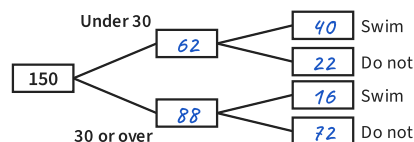
A	+	1	2	3
	2	3	4	5
B	4	5	6	7
	6	7	8	9

$$\text{a) } \frac{6}{9} = \frac{2}{3} \quad \text{b) } \frac{4}{9}$$

5 Frequency trees

150 people use a gym. 62 are under 30, and 40 of those swim. 56 of the 150 swim.

- a) Complete the frequency tree.
b) Find $P(30 \text{ or over and does not swim})$.



$$\text{b) } \frac{72}{150} = \frac{12}{25}$$

Probability

revision mat answers

6 Two way tables

90 people ordered tea or coffee, with or without cake.

- a) Find $P(\text{coffee and cake})$.
b) A cake eater is picked. Find $P(\text{tea})$.

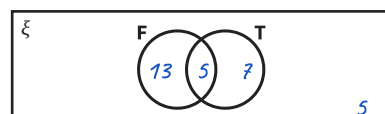
	Cake	No cake	Total
Tea	14	26	40
Coffee	18	32	50
Total	32	58	90

$$\text{a) } \frac{18}{90} = \frac{1}{5} \quad \text{b) } \frac{14}{32} = \frac{7}{16}$$

7 Venn diagrams

30 students: 18 play football (F), 12 play tennis (T), 5 play both.

- a) Complete the Venn diagram.
b) Find $P(F' \cap T)$.



$$\text{b) } \frac{7}{30}$$

8 The AND and OR rules

$P(\text{Sam scores a penalty}) = 0.7$. He takes two penalties, and the two are independent.

- a) Find $P(\text{he scores both})$.
b) Find $P(\text{he scores exactly one})$.

$$\begin{aligned} \text{a) } 0.7 \times 0.7 &= 0.49 \\ \text{b) } 0.7 \times 0.3 + 0.3 \times 0.7 &= 0.42 \end{aligned}$$

9 Tree diagrams

$P(\text{rain on Saturday}) = 0.3$. If it rains on Saturday, $P(\text{rain on Sunday}) = 0.6$. If not, it is 0.2.

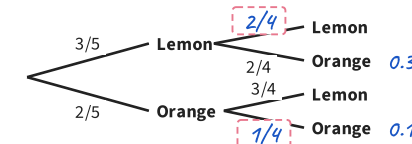
- a) Find $P(\text{rain on both days})$.
b) Find $P(\text{rain on just one of the days})$.

$$\begin{aligned} \text{a) } 0.3 \times 0.6 &= 0.18 \\ \text{b) } 0.3 \times 0.4 + 0.7 \times 0.2 &= 0.26 \end{aligned}$$

10 Conditional probability

Sweets taken without replacement.

- a) Find $P(\text{second is orange})$.
b) The second is orange. Find $P(\text{first is lemon})$.



$$\text{a) } 0.4 \quad \text{b) } 0.3 \div 0.4 = 0.75$$