Solutions

Marking: **M1** a correct method, **A1** the correct answer.

Each answer shows the steps, then the **result**.

2.1

- look only at the 12 dog owners

$$\frac{5}{12}$$

2.2

$$\mathrm{P}(B \mid A) = \frac{\mathrm{P}(A \cap B)}{\mathrm{P}(A)} = \frac{0.2}{0.5} = \mathbf{0.4}$$

2.3

- look only at the 24 walkers

$$\frac{9}{24} = \mathbf{\frac{3}{8}}$$

2.4

- $\mathrm{P}(A \cap B) = \mathrm{P}(A) \times \mathrm{P}(B \mid A) = 0.6 \times 0.3 = \mathbf{0.18}$

2.5

- the Spanish students are the new total: 12, of whom 5 study French

$$\mathrm{P} = \mathbf{\frac{5}{12}}$$

3.1

(a)

$$\frac{5}{8} \times \frac{3}{7} = \mathbf{\frac{15}{56}}$$

(b)

- $\mathrm{P}(\text{red, red}) = \frac{5}{8} \times \frac{4}{7} = \frac{20}{56}$
- $\mathrm{P}(\text{blue, blue}) = \frac{3}{8} \times \frac{2}{7} = \frac{6}{56}$
- total $\frac{26}{56} = \mathbf{\frac{13}{28}}$

3.2

(a)

- 9 counters are left, of which 3 are green: $\mathbf{\frac{3}{9}} = \mathbf{\frac{1}{3}}$

(b)

- at least one green $= 1 - \mathrm{P}(\text{both yellow})$
- $\mathrm{P}(\text{both yellow}) = \frac{6}{10} \times \frac{5}{9} = \frac{30}{90} = \frac{1}{3}$
- $1 - \frac{1}{3} = \mathbf{\frac{2}{3}}$

3.3

(a)

- the people who like tea are the new total: $35 + 10 = 45$

$$\mathrm{P}(\text{adult} \mid \text{tea}) = \frac{35}{45} = \mathbf{\frac{7}{9}}$$

(b)

- $\mathrm{P}(\text{tea} \mid \text{child}) = \frac{10}{40} = \mathbf{\frac{1}{4}}$

3.4

- $\mathrm{P}(\text{both red}) = \frac{5}{8} \times \frac{4}{7} = \frac{20}{56}$ and $\mathrm{P}(\text{both blue}) = \frac{3}{8} \times \frac{2}{7} = \frac{6}{56}$
- $\mathrm{P}(\text{same colour}) = \frac{20}{56} + \frac{6}{56} = \frac{26}{56}$

$$\mathrm{P}(\text{both red} \mid \text{same}) = \frac{20}{26} = \mathbf{\frac{10}{13}}$$