

Solutions

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

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

2.1

$$\begin{aligned} \bullet \quad \frac{1}{2} \times \frac{1}{2} \\ = \frac{1}{4} \end{aligned}$$

2.2

$$\begin{aligned} \bullet \quad \text{with replacement the probabilities are unchanged: } \frac{5}{8} \times \frac{5}{8} \\ = \frac{25}{64} \end{aligned}$$

2.3

$$\begin{aligned} \bullet \quad \text{after one red is removed, 4 reds remain out of 7 counters} \\ \bullet \quad \frac{5}{8} \times \frac{4}{7} = \frac{20}{56} \\ = \frac{5}{14} \end{aligned}$$

3.1

(a)

$$\begin{aligned} \bullet \quad \frac{7}{12} \times \frac{6}{11} \\ = \frac{42}{132} = \frac{7}{22} \end{aligned}$$

(b)

- green then yellow: $\frac{7}{12} \times \frac{5}{11} = \frac{35}{132}$
- yellow then green: $\frac{5}{12} \times \frac{7}{11} = \frac{35}{132}$
- there are TWO orders, so add them

$$\frac{70}{132} = \frac{35}{66}$$

(c)

- “at least one yellow” is the opposite of “both green”

$$1 - \frac{7}{22} = \frac{15}{22}$$

3.2

- rain then dry: $0.3 \times 0.7 = 0.21$
- dry then rain: $0.7 \times 0.3 = 0.21$

$$0.21 + 0.21 = \mathbf{0.42}$$

- forgetting the second order and answering 0.21 is the standard loss here