



ACHIEVE ACADEMY

GCSE Maths — Foundation Tier

Tree Diagrams · Practice Booklet

NAME: _____

CLASS: _____

DATE: _____

☒ Developing

☒ Secure

☐ Greater Depth

Answer every question in the working space provided. Method marks are available for correct working even if the final answer is wrong. Check the time allowed with your tutor before you start.

Tree Diagrams

Total marks available: 83

● Tree Diagrams

- ✓ (a) Odd, Yellow; Odd, Red; Odd, Green;
Even, Yellow; Even, Red; Even, Green (b) 6

Q1 · ● Developing · 2 marks

METHOD

Follow each path from left to right: Odd, Yellow; Odd, Red; Odd, Green; Even, Yellow; Even, Red; Even, Green

$2 \times 3 = 6$ outcomes

- ✓ Not late (Monday) = 0.4; Not late
(Tuesday) = 0.2 on both branches

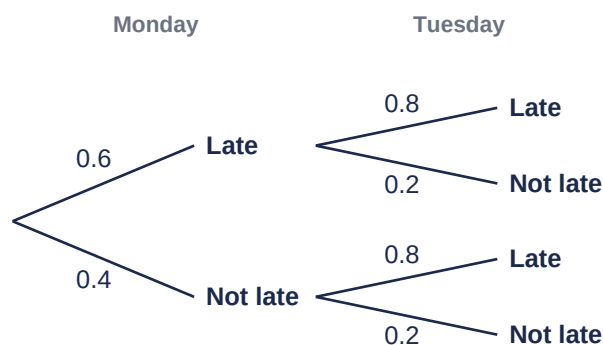
Q2 · ● Developing · 2 marks

METHOD

Probabilities on each pair of branches add up to 1

Monday: $1 - 0.6 = 0.4$

Tuesday: $1 - 0.8 = 0.2$ (on both pairs)



- ✓ (a) Odd, Blue; Odd, Yellow; Odd, Green;
Even, Blue; Even, Yellow; Even, Green (b) 6

Q3 · ● Developing · 2 marks

METHOD

Follow each path from left to right: Odd, Blue; Odd, Yellow; Odd, Green; Even, Blue; Even, Yellow; Even, Green

$2 \times 3 = 6$ outcomes

- ✓ (a) Heads, Red; Heads, Yellow; Heads, Blue; Tails, Red; Tails, Yellow; Tails, Blue
(b) 6

Q4 · ● Developing · 2 marks

METHOD

Follow each path from left to right: Heads, Red; Heads, Yellow; Heads, Blue; Tails, Red; Tails, Yellow; Tails, Blue

$2 \times 3 = 6$ outcomes

- ✓ Not win (Game 1) = 0.1; Not win (Game 2) = 0.1 on both branches

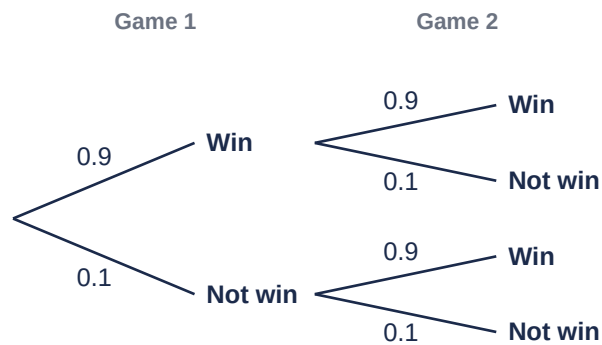
Q5 · ● Developing · 2 marks

METHOD

Probabilities on each pair of branches add up to 1

Game 1: $1 - 0.9 = 0.1$

Game 2: $1 - 0.9 = 0.1$ (on both pairs)



- ✓ (a) Odd, Red; Odd, Green; Odd, Blue; Even, Red; Even, Green; Even, Blue (b) 6

Q6 · ● Developing · 2 marks

METHOD

Follow each path from left to right: Odd, Red; Odd, Green; Odd, Blue; Even, Red; Even, Green; Even, Blue

$2 \times 3 = 6$ outcomes

✓ (a) Odd, Green; Odd, Yellow; Odd, Red;
Even, Green; Even, Yellow; Even, Red (b) 6

Q7 · ● Developing · 2 marks

METHOD

Follow each path from left to right: odd, green; odd, yellow; odd, red; even, green; even, yellow; even, red

$2 \times 3 = 6$ outcomes

✓ Miss (Shot 1) = 0.2; Miss (Shot 2) = 0.3 on both branches

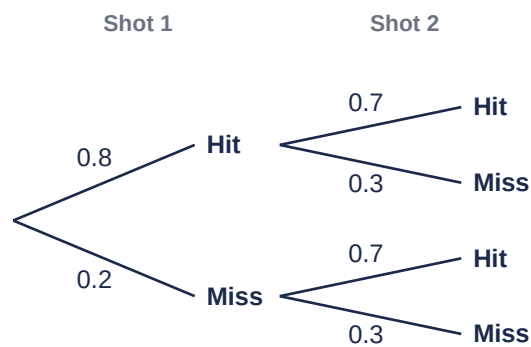
Q8 · ● Developing · 2 marks

METHOD

Probabilities on each pair of branches add up to 1

Shot 1: $1 - 0.8 = 0.2$

Shot 2: $1 - 0.7 = 0.3$ (on both pairs)



✓ Miss (Shot 1) = 0.9; Miss (Shot 2) = 0.4 on both branches

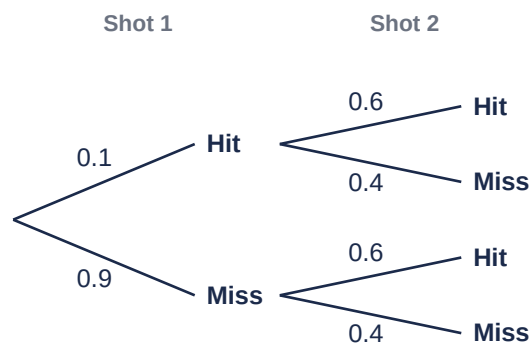
Q9 · ● Developing · 2 marks

METHOD

Probabilities on each pair of branches add up to 1

Shot 1: $1 - 0.1 = 0.9$

Shot 2: $1 - 0.6 = 0.4$ (on both pairs)



✓ Fail (Amy) = 0.2; Fail (Ben) = 0.3 on both branches

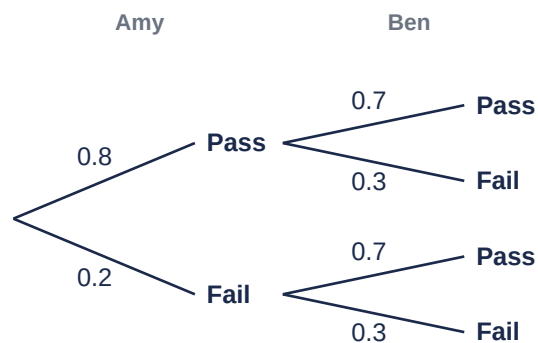
Q10 · ● Developing · 2 marks

METHOD

Probabilities on each pair of branches add up to 1

Amy: $1 - 0.8 = 0.2$

Ben: $1 - 0.7 = 0.3$ (on both pairs)



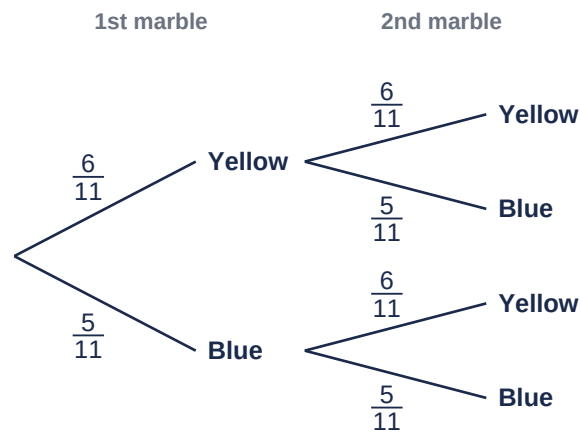
✓ (a) see diagram; (b) 36/121

Q11 · ● Secure · 4 marks

METHOD

$P(\text{yellow}) = 6/11$, $P(\text{blue}) = 5/11$ on every pair of branches (the marble is replaced)

(b) $6/11 \times 6/11 = 36/121$



✓ 1/12

Q12 · ● Secure · 2 marks

METHOD

$1/3 \times 1/4 = 1/12$

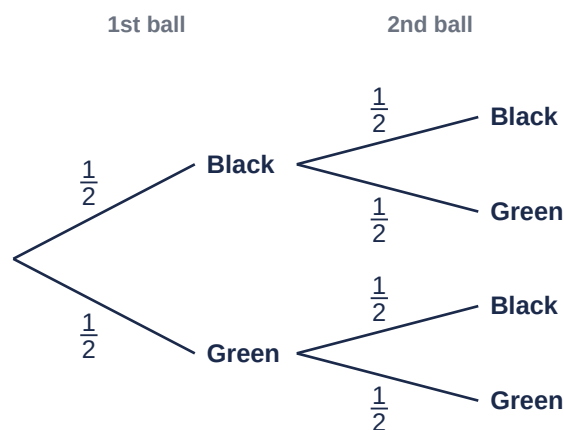
✓ (a) see diagram; (b) 1/4

Q13 · ● Secure · 4 marks

METHOD

$P(\text{black}) = 2/4$, $P(\text{green}) = 2/4$ on every pair of branches (the ball is replaced)

(b) $1/2 \times 1/2 = 1/4$



✓ 1/4

Q14 · ● Secure · 2 marks

METHOD

$$\frac{1}{3} \times \frac{3}{4} = \frac{1}{4}$$

✓ 0.24

Q15 · ● Secure · 2 marks

METHOD

$$0.4 \times 0.6 = 0.24$$

✓ 2/15

Q16 · ● Secure · 2 marks

METHOD

$$\frac{1}{3} \times \frac{2}{5} = \frac{2}{15}$$

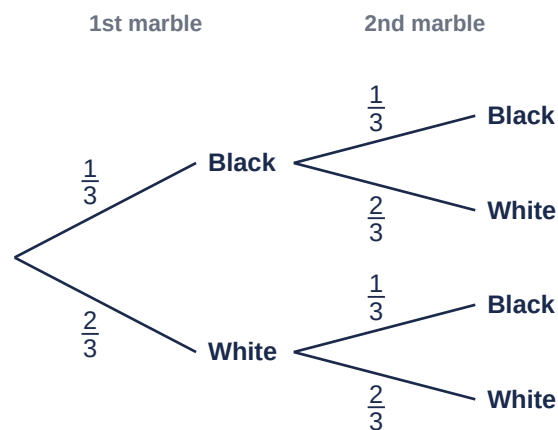
✓ (a) see diagram; (b) 1/9

Q17 · ● Secure · 4 marks

METHOD

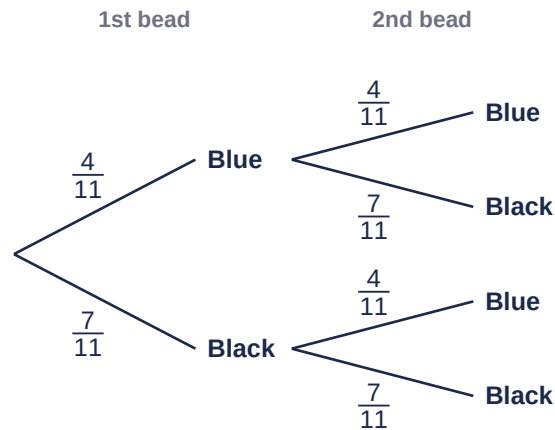
$P(\text{black}) = \frac{2}{6}$, $P(\text{white}) = \frac{4}{6}$ on every pair of branches (the marble is replaced)

(b) $\frac{1}{3} \times \frac{1}{3} = \frac{1}{9}$



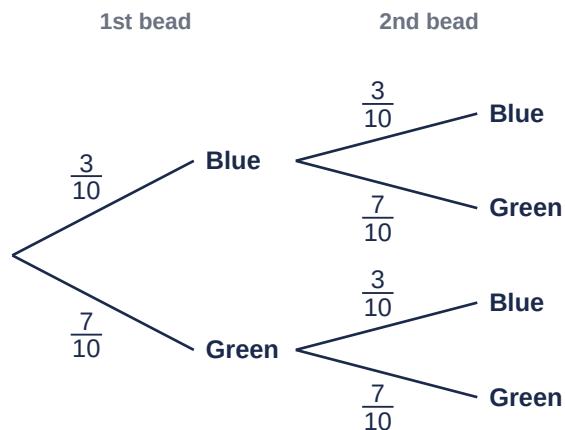
Q18 · ● Secure · 4 marks

(b) $7/11 \times 7/11 = 49/121$



Q19 · ● Secure · 4 marks

(b) $3/10 \times 3/10 = 9/100$



Q20 · ● Secure · 2 marks

$$0.5 \times 0.2 = 0.1$$

✓0.58

Q21 · ● Greater Depth · 3 marks

METHOD

$$\text{Hit, Miss: } 0.1 \times 0.4 = 0.04$$

$$\text{Miss, Hit: } 0.9 \times 0.6 = 0.54$$

$$0.04 + 0.54 = 0.58$$

✓0.65

Q22 · ● Greater Depth · 3 marks

METHOD

$$P(\text{Not late, Not late}) = 0.7 \times 0.5 = 0.35$$

$$P(\text{at least one}) = 1 - 0.35 = 0.65$$

✓0.93

Q23 · ● Greater Depth · 3 marks

METHOD

$$P(\text{Fail, Fail}) = 0.7 \times 0.1 = 0.07$$

$$P(\text{at least one}) = 1 - 0.07 = 0.93$$

✓ (a) see diagram; (b) 24/49

Q24 · ● Greater Depth · 4 marks

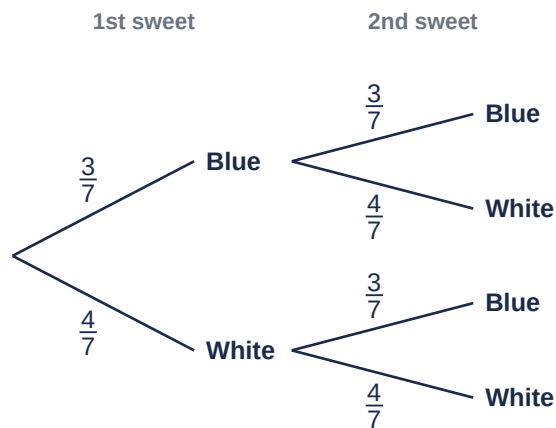
METHOD

(a) Second branches are the same as the first: $\frac{3}{7}$ and $\frac{4}{7}$

(b) Blue, White: $\frac{3}{7} \times \frac{4}{7} = \frac{12}{49}$

White, Blue: $\frac{4}{7} \times \frac{3}{7} = \frac{12}{49}$

$\frac{12}{49} + \frac{12}{49} = \frac{24}{49}$



✓ (a) see diagram; (b) 84/169

Q25 · ● Greater Depth · 4 marks

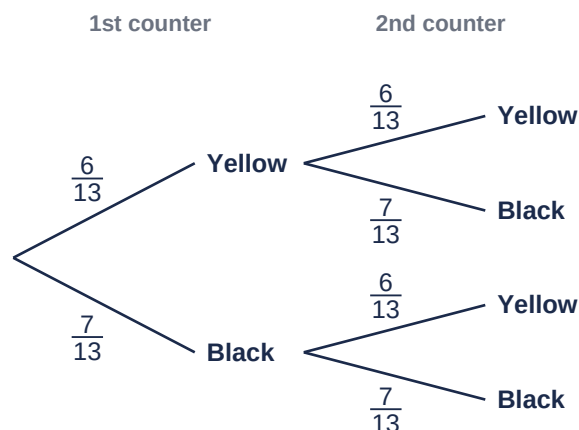
METHOD

(a) Second branches are the same as the first: $\frac{6}{13}$ and $\frac{7}{13}$

(b) Yellow, Black: $\frac{6}{13} \times \frac{7}{13} = \frac{42}{169}$

Black, Yellow: $\frac{7}{13} \times \frac{6}{13} = \frac{42}{169}$

$\frac{42}{169} + \frac{42}{169} = \frac{84}{169}$



✓0.92

Q26 · ● Greater Depth · 3 marks

METHOD

$$P(\text{Fail}, \text{Fail}) = 0.8 \times 0.1 = 0.08$$

$$P(\text{at least one}) = 1 - 0.08 = 0.92$$

✓ (a) see diagram; (b) $3/8$

Q27 · ● Greater Depth · 4 marks

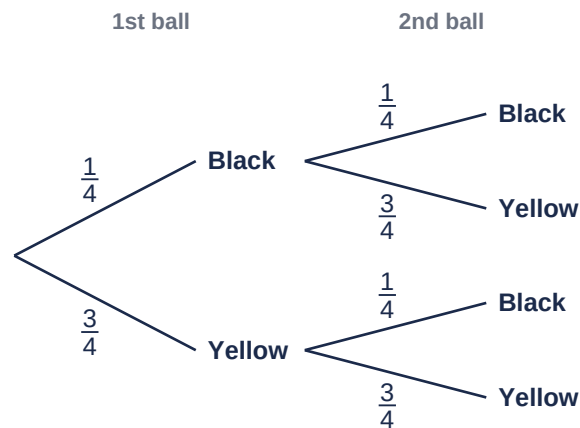
METHOD

(a) Second branches are the same as the first: $1/4$ and $3/4$

(b) Black, Yellow: $1/4 \times 3/4 = 3/16$

Yellow, Black: $3/4 \times 1/4 = 3/16$

$$3/16 + 3/16 = 3/8$$



✓5/12

Q28 · ● Greater Depth · 3 marks

METHOD

Late, Not late: $3/4 \times 1/3 = 1/4$

Not late, Late: $1/4 \times 2/3 = 1/6$

$$1/4 + 1/6 = 5/12$$

✓0.58

Q29 · ● Greater Depth · 3 marks

METHOD

Win, Not win: $0.6 \times 0.9 = 0.54$

Not win, Win: $0.4 \times 0.1 = 0.04$

$0.54 + 0.04 = 0.58$

✓0.58

Q30 · ● Greater Depth · 3 marks

METHOD

Late, Not late: $0.1 \times 0.4 = 0.04$

Not late, Late: $0.9 \times 0.6 = 0.54$

$0.04 + 0.54 = 0.58$