



ACHIEVE ACADEMY

GCSE Maths — Higher Tier

Tree Diagrams & Conditional Probability · 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 & Conditional Probability

Total marks available: 99

● Tree Diagrams & Conditional Probability

✓ 0.63

Q1 · ● Developing · 2 marks

METHOD

$$0.9 \times 0.7 = 0.63$$

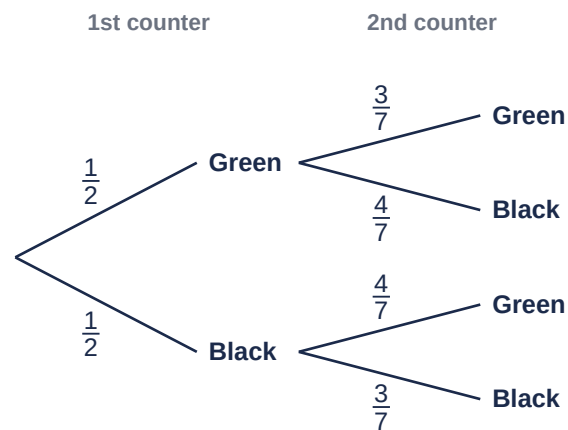
✓ After Green: Green $\frac{3}{7}$, Black $\frac{4}{7}$; after Black: Green $\frac{4}{7}$, Black $\frac{3}{7}$

Q2 · ● Developing · 2 marks

METHOD

After a green: 3 green and 4 black left out of 7

After a black: 4 green and 3 black left out of 7



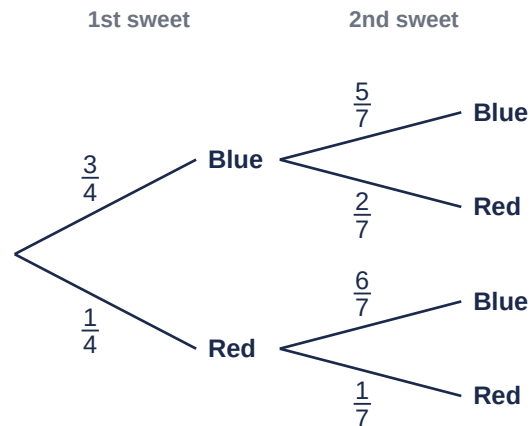
✓ After Blue: Blue $\frac{5}{7}$, Red $\frac{2}{7}$; after Red:
Blue $\frac{6}{7}$, Red $\frac{1}{7}$

Q3 · ● Developing · 2 marks

METHOD

After a blue: 5 blue and 2 red left out of 7

After a red: 6 blue and 1 red left out of 7



✓ $\frac{2}{5}$

Q4 · ● Developing · 2 marks

METHOD

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

✓ $\frac{1}{2}$

Q5 · ● Developing · 2 marks

METHOD

$$\frac{3}{4} \times \frac{2}{3} = \frac{1}{2}$$

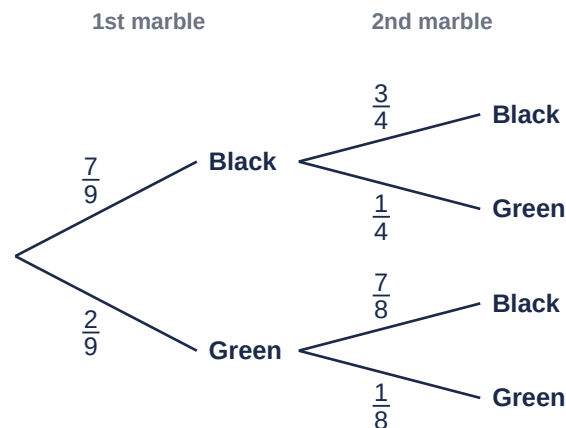
✓ After Black: Black $\frac{3}{4}$, Green $\frac{1}{4}$; after Green: Black $\frac{7}{8}$, Green $\frac{1}{8}$

Q6 · ● Developing · 2 marks

METHOD

After a black: 6 black and 2 green left out of 8

After a green: 7 black and 1 green left out of 8



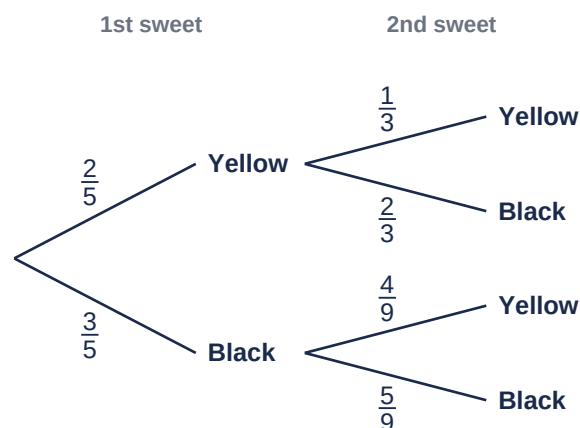
✓ After Yellow: Yellow $\frac{1}{3}$, Black $\frac{2}{3}$; after Black: Yellow $\frac{4}{9}$, Black $\frac{5}{9}$

Q7 · ● Developing · 2 marks

METHOD

After a yellow: 3 yellow and 6 black left out of 9

After a black: 4 yellow and 5 black left out of 9



✓0.32

Q8 · ● Developing · 2 marks

METHOD

$$0.8 \times 0.4 = 0.32$$

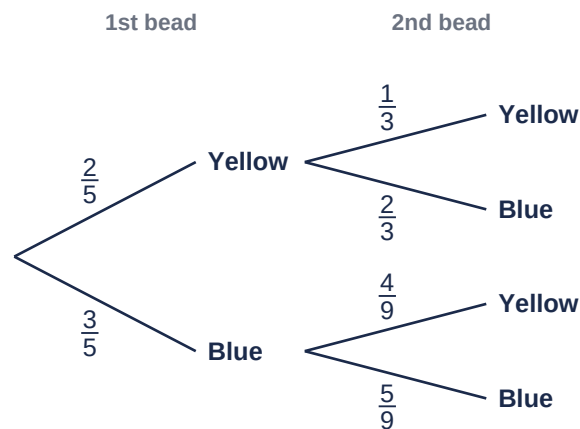
✓ After Yellow: Yellow $\frac{1}{3}$, Blue $\frac{2}{3}$; after Blue: Yellow $\frac{4}{9}$, Blue $\frac{5}{9}$

Q9 · ● Developing · 2 marks

METHOD

After a yellow: 3 yellow and 6 blue left out of 9

After a blue: 4 yellow and 5 blue left out of 9



✓6/25

Q10 · ● Developing · 2 marks

METHOD

$$2/5 \times 3/5 = 6/25$$

✓0.54

Q11 · ● Secure · 3 marks

METHOD

Coffee, Pastry: $0.8 \times 0.5 = 0.4$ No coffee, Pastry: $0.2 \times 0.7 = 0.14$

$$0.4 + 0.14 = 0.54$$

✓0.16

Q12 · ● Secure · 3 marks

METHOD

Coffee, Pastry: $0.1 \times 0.7 = 0.07$

No coffee, Pastry: $0.9 \times 0.1 = 0.09$

$0.07 + 0.09 = 0.16$

✓7/20

Q13 · ● Secure · 3 marks

METHOD

Revise, Pass: $1/3 \times 1/4 = 1/12$

Not revise, Pass: $2/3 \times 2/5 = 4/15$

$1/12 + 4/15 = 7/20$

✓0.104

Q14 · ● Secure · 3 marks

METHOD

Exactly two: $3 \times 0.032 = 0.096$

All three: 0.008

$0.096 + 0.008 = 0.104$

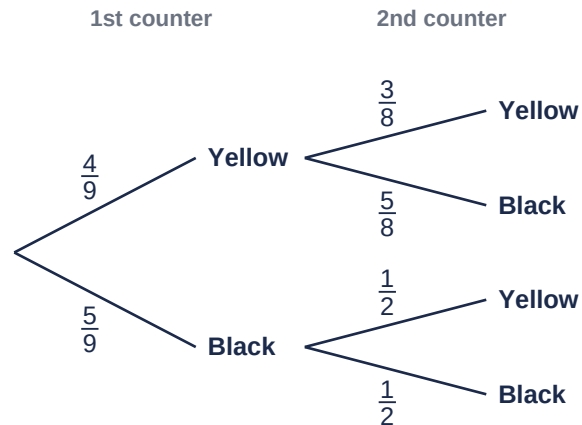
✓ (a) see diagram; (b) 4/9

Q15 · ● Secure · 5 marks

METHOD

(b) Yellow, Yellow: $\frac{4}{9} \times \frac{3}{8} = \frac{1}{6}$

Black, Black: $\frac{5}{9} \times \frac{4}{8} = \frac{5}{18}$

$$\frac{1}{6} + \frac{5}{18} = \frac{4}{9}$$


✓ 0.216

Q16 · ● Secure · 3 marks

METHOD

Exactly two: $3 \times 0.063 = 0.189$

All three: 0.027

$$0.189 + 0.027 = 0.216$$

✓ 0.74

Q17 · **Secure** · **3 marks**

METHOD

Revise, Pass: $0.9 \times 0.8 = 0.72$

Not revise, Pass: $0.1 \times 0.2 = 0.02$

$$0.72 + 0.02 = 0.74$$

✓ (a) see diagram; (b) $1/2$

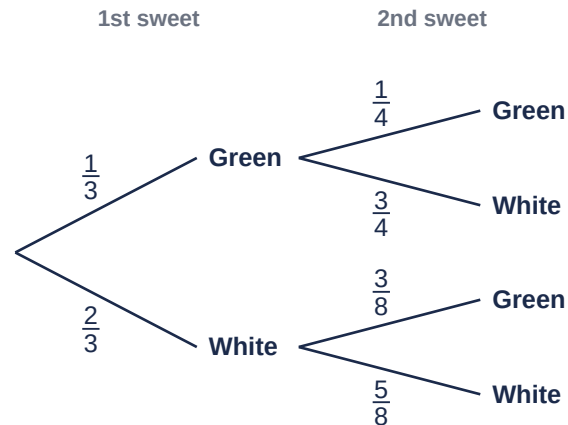
Q18 · ● Secure · 5 marks

METHOD

(b) Green, Green: $3/9 \times 2/8 = 1/12$

White, White: $6/9 \times 5/8 = 5/12$

$1/12 + 5/12 = 1/2$



✓ $5/32$

Q19 · ● Secure · 3 marks

METHOD

Exactly two: $3 \times 3/64 = 9/64$

All three: $1/64$

$9/64 + 1/64 = 5/32$

✓ (a) see diagram; (b) $7/15$

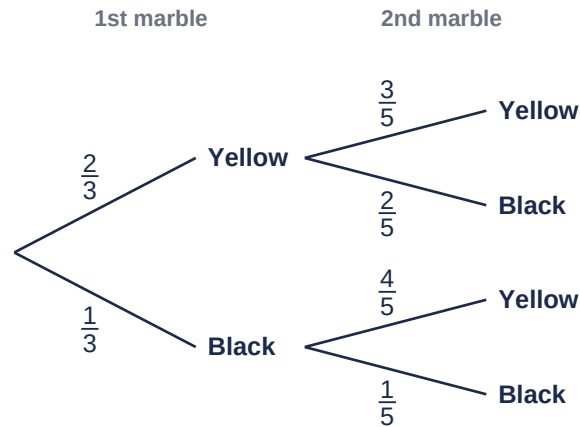
Q20 · ● Secure · 5 marks

METHOD

(b) Yellow, Yellow: $4/6 \times 3/5 = 2/5$

Black, Black: $2/6 \times 1/5 = 1/15$

$2/5 + 1/15 = 7/15$



✓ (a) see diagram; (b) 0.64

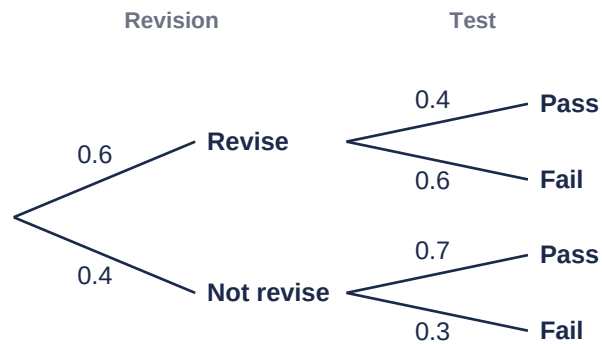
Q21 · ● Greater Depth · 5 marks

METHOD

(b) Revise, Fail: $0.6 \times 0.6 = 0.36$

Not revise, Pass: $0.4 \times 0.7 = 0.28$

$0.36 + 0.28 = 0.64$



✓ (a) 0.3; (b) see diagram

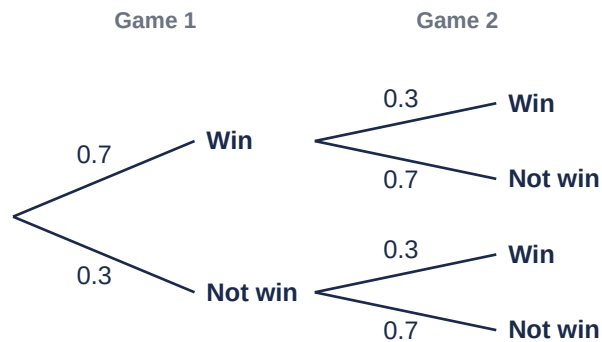
Q22 · ● Greater Depth · 4 marks

METHOD

(a) $0.7 \times p = 0.21$

$p = 0.21 \div 0.7 = 0.3$

(b) Game 2: Win 0.3, Not win $1 - 0.3 = 0.7$ on both pairs of branches



✓ (a) see diagram; (b) 0.23

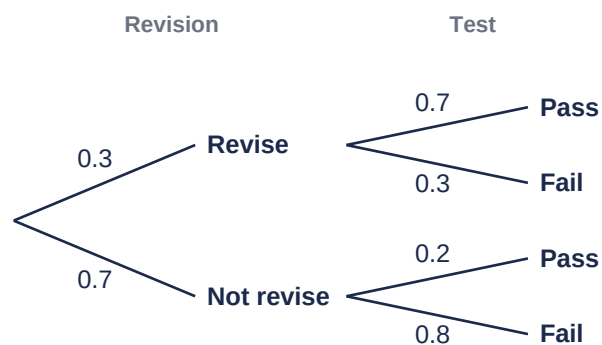
Q23 · ● Greater Depth · 5 marks

METHOD

(b) Revise, Fail: $0.3 \times 0.3 = 0.09$

Not revise, Pass: $0.7 \times 0.2 = 0.14$

$0.09 + 0.14 = 0.23$



✓ (a) see diagram; (b) 0.63

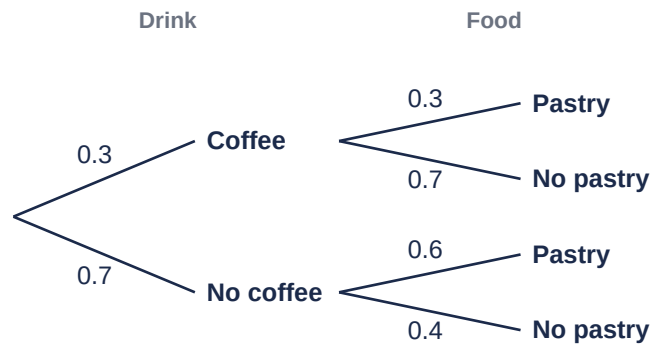
Q24 · ● Greater Depth · 5 marks

METHOD

(b) Coffee, No pastry: $0.3 \times 0.7 = 0.21$

No coffee, Pastry: $0.7 \times 0.6 = 0.42$

$0.21 + 0.42 = 0.63$



✓ 18/35

Q25 · ● Greater Depth · 4 marks

METHOD

Yellow, Yellow, Black: $\frac{4}{7} \times \frac{3}{6} \times \frac{3}{5} = \frac{6}{35}$

The other two orders give the same product

$3 \times \frac{6}{35} = \frac{18}{35}$

✓ 15/56

Q26 · ● Greater Depth · 4 marks

METHOD

Yellow, Yellow, Green: $\frac{3}{8} \times \frac{2}{7} \times \frac{5}{6} = \frac{5}{56}$

The other two orders give the same product

$3 \times \frac{5}{56} = \frac{15}{56}$

✓ 5/6

Q27 · ● Greater Depth · 4 marks

METHOD

$P(\text{no white}) = \frac{6}{10} \times \frac{5}{9} \times \frac{4}{8} = \frac{1}{6}$

$1 - \frac{1}{6} = \frac{5}{6}$

✓ (a) 0.3; (b) see diagram

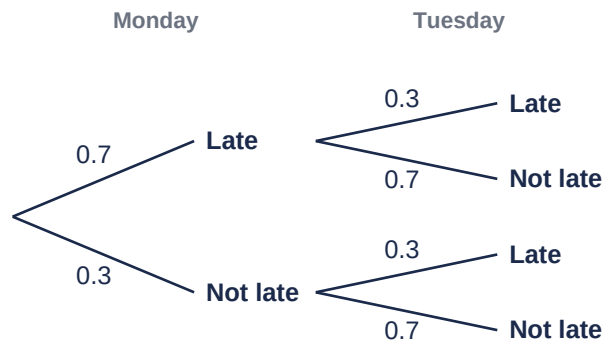
Q28 · ● Greater Depth · 4 marks

METHOD

$$(a) 0.7 \times p = 0.21$$

$$p = 0.21 \div 0.7 = 0.3$$

(b) Tuesday: Late 0.3, Not late $1 - 0.3 = 0.7$ on both pairs of branches



✓ 19/20

Q29 · ● Greater Depth · 4 marks

METHOD

$$P(\text{no red}) = 3/6 \times 2/5 \times 1/4 = 1/20$$

$$1 - 1/20 = 19/20$$

✓ (a) 0.6; (b) see diagram

Q30 · ● Greater Depth · 4 marks

METHOD

$$(a) 0.6 \times p = 0.36$$

$$p = 0.36 \div 0.6 = 0.6$$

(b) Ben: Pass 0.6, Fail $1 - 0.6 = 0.4$ on both pairs of branches

