

Probability Trees

Mark Scheme

Level	GCSE
Subject	Maths
Exam Board	Edexcel GCSE
Topic	Probability Trees
Grade Level	Grade 5
Booklet	Mark Scheme

Time Allowed: 37 minutes

Score: /31

Percentage: /100

Grade Boundaries:

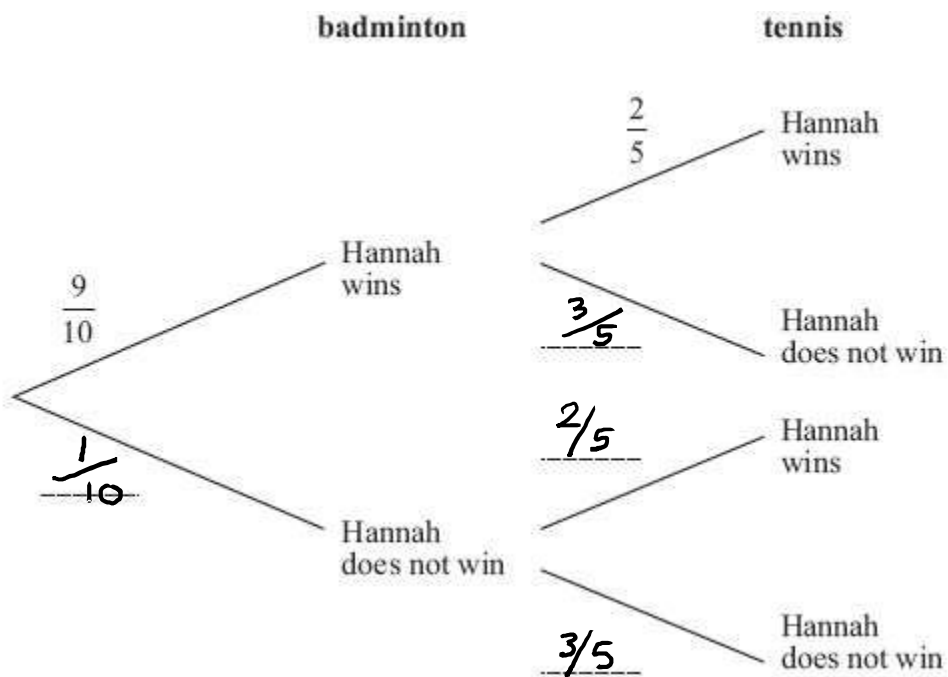
1. Hannah is going to play one badminton match and one tennis match.

The probability that she will win the badminton match is $\frac{9}{10}$

The probability that she will win the tennis match is $\frac{2}{5}$

- (a) Complete the probability tree diagram.

(2)



- (b) Work out the probability that Hannah will win **both** matches.

(2)

$$\frac{9}{10} \times \frac{2}{5} = \frac{18}{50}$$

$$\frac{18}{50}$$

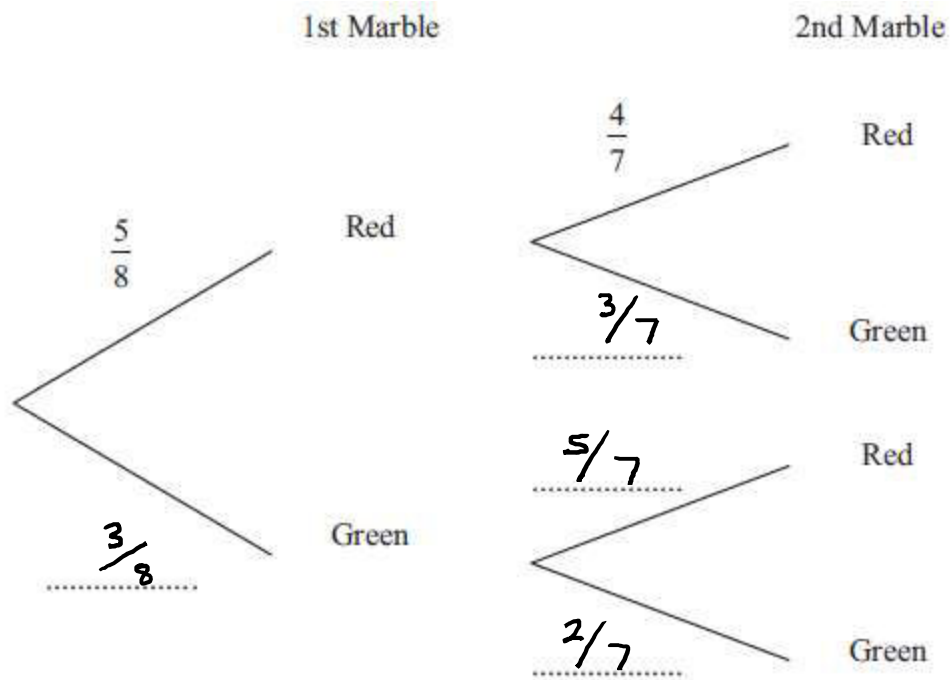
(4 marks)

2. There are only red marbles and green marbles in a bag.
There are 5 red marbles and 3 green marbles.

Dwayne takes at random a marble from the bag.
He does not put the marble back in the bag.

Dwayne takes at random a second marble from the bag.

- (a) Complete the probability tree diagram.



(2)

- (b) Work out the probability that Dwayne takes marbles of different colours.

$$P(RG) = \frac{5}{8} \times \frac{3}{7} = \frac{15}{56}$$

$$P(GR) = \frac{3}{8} \times \frac{5}{7} = \frac{15}{56}$$

$$\frac{30}{56}$$

(3)

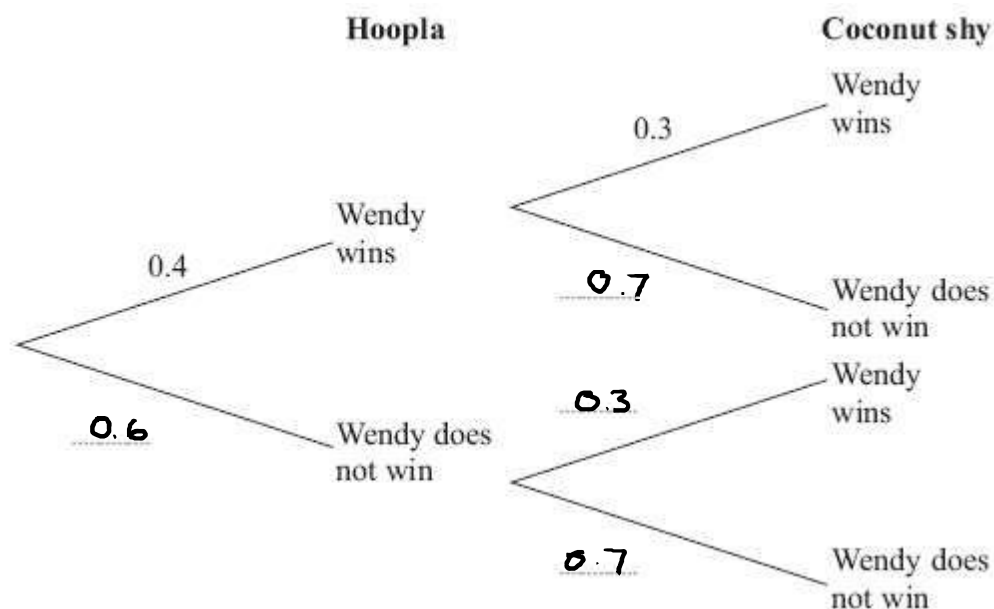
(5 marks)

3. Wendy goes to a fun fair.
She has one go at Hoopla.
She has one go on the Coconut shy.

The probability that she wins at Hoopla is 0.4

The probability that she wins on the Coconut shy is 0.3

- (a) Complete the probability tree diagram.



(2)

- (b) Work out the probability that Wendy wins at Hoopla and also wins on the Coconut shy.

$$0.4 \times 0.3$$

$$0.12$$

(2)

(4 marks)

4. There are 5 red pens, 3 blue pens and 2 green pens in a box.

Gary takes at random a pen from the box and gives the pen to his friend.
Gary then takes at random another pen from the box.

Work out the probability that both pens are the same colour.

$$P(RR) \quad \frac{5}{10} \times \frac{4}{9} = \frac{20}{90}$$

$$P(BB) \quad \frac{3}{10} \times \frac{2}{9} = \frac{6}{90}$$

$$P(GG) \quad \frac{2}{10} \times \frac{1}{9} = \frac{2}{90}$$

$$\frac{28}{90}$$

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(4 marks)

5. Carolyn has 20 biscuits in a tin.

She has

12 plain biscuits
5 chocolate biscuits
3 ginger biscuits

Carolyn takes at random two biscuits from the tin.

Work out the probability that the two biscuits were **not** the same type.

$$P(\text{not same}) = 1 - P(\text{same})$$

$$P(pp) = \frac{12}{20} \times \frac{11}{19} = \frac{132}{380}$$

$$P(cc) = \frac{5}{20} \times \frac{4}{19} = \frac{20}{380}$$

$$P(gg) = \frac{3}{20} \times \frac{2}{19} = \frac{6}{380}$$

$$P(\text{same}) = \frac{158}{380}$$

$$1 - \frac{158}{380} = \frac{222}{380}$$

$$\frac{222}{380}$$

(4 marks)

6. Here are seven tiles.



Jim takes at random a tile.
He does **not** replace the tile.

Jim then takes at random a second tile.

- (a) Calculate the probability that both the tiles Jim takes have the number 1 on them.

$$\frac{2}{7} \times \frac{1}{6} = \frac{2}{42}$$

$$\frac{2}{42}$$

(2)

- (b) Calculate the probability that the number on the second tile Jim takes is greater than the number on the first tile he takes.

1, 2 1, 3 2, 3

$$P(1,2) = \frac{2}{7} \times \frac{3}{6} = \frac{6}{42}$$

$$P(1,3) = \frac{2}{7} \times \frac{2}{6} = \frac{4}{42}$$

$$P(2,3) = \frac{3}{7} \times \frac{2}{6} = \frac{6}{42}$$

$$\frac{16}{42}$$

(3)

(5 marks)

7. There are three different types of sandwiches on a shelf.

There are

4 egg sandwiches,
5 cheese sandwiches
and 2 ham sandwiches.

Erin takes at random 2 of these sandwiches.

Work out the probability that she takes 2 different types of sandwiches.

$$P(2 \text{ different}) = 1 - P(2 \text{ same})$$

$$P(EE) = \frac{4}{11} \times \frac{3}{10} = \frac{12}{110}$$

$$P(CC) = \frac{5}{11} \times \frac{4}{10} = \frac{20}{110}$$

$$P(HH) = \frac{2}{11} \times \frac{1}{10} = \frac{2}{110}$$

$$P(2 \text{ same}) = \frac{34}{110}$$

$$1 - \frac{34}{110} = \frac{76}{110}$$

$$\frac{76}{110}$$

(5 marks)