

Write your name here

Surname

Other names

In the style of:

Pearson Edexcel

Level 1/Level 2 GCSE (9 - 1)

Centre Number

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Candidate Number

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Mathematics

Probability

Higher Tier

GCSE style questions arranged by topic

Paper Reference

1MA1/2H

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- **Calculators may be used.**
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out.**



Information

- The total mark for this paper is
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

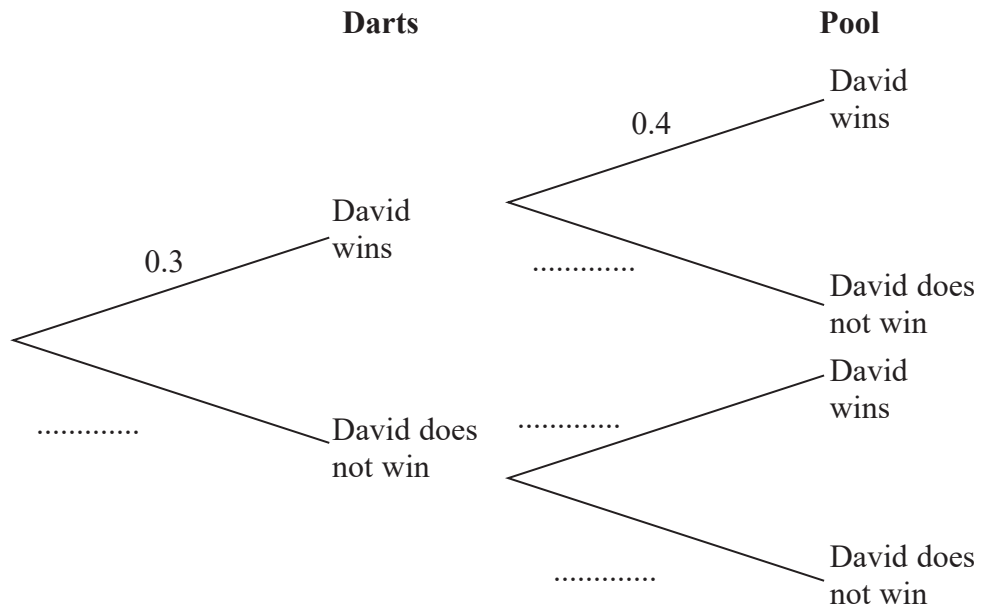
Turn over ►



- 1 David goes to a club.
He has one go at Darts.
He has one go at Pool.

The probability that he wins at Darts is 0.3
The probability that he wins at Pool is 0.4

- (a) Complete the probability tree diagram.



(2)

- (b) Work out the probability that David wins at Darts and also wins at Pool.

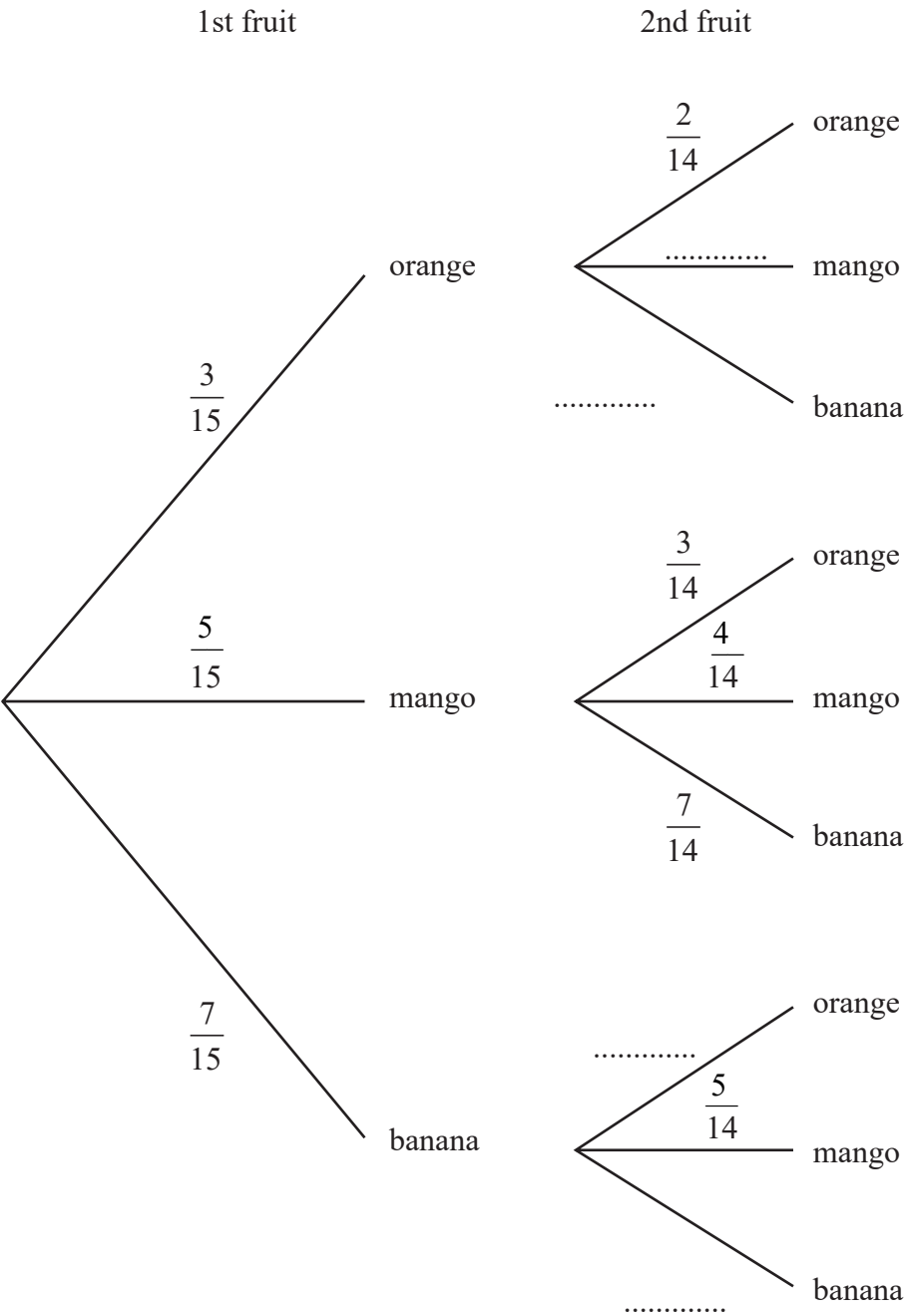
(2)

Total for Question 1 is 4 marks)

2 A bowl contains 3 oranges, 5 mangoes and 7 bananas.

One fruit is taken, at random, from the bowl and **not** replaced. Another fruit is then taken, at random, from the bowl.

A tree diagram representing these two events is shown below.



(a) Complete the tree diagram representing these two events. (2)

(b) Find the probability that both fruit are bananas. Give your answer as a simplified fraction.

.....

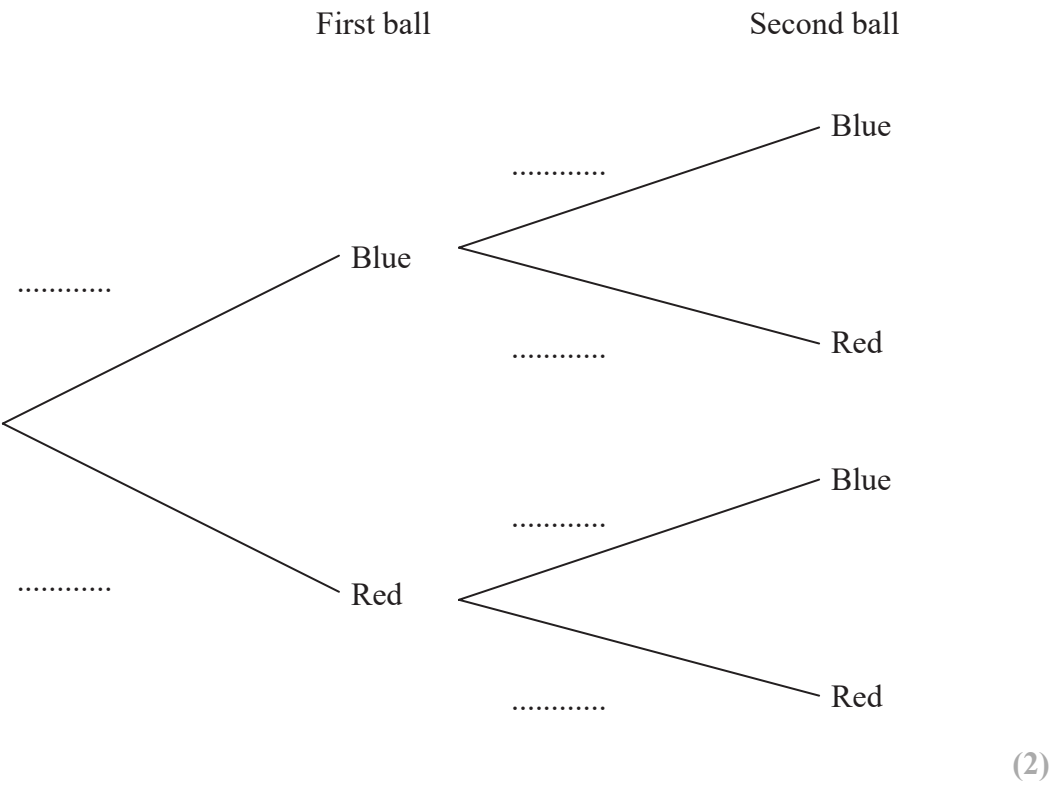
(2)

- 3 Tara has 8 balls in a box.
 5 of the balls are blue.
 3 of the balls are red.

Tara takes at random a ball from the box and writes down its colour.
 Tara puts the ball back in the box.

Then Tara takes at random a second ball from the box, and writes down its colour.

- (a) Complete the probability tree diagram.



- (b) Work out the probability that Tara takes exactly one ball of each colour from the box.

.....
 (3)

(Total for Question 3 is 5 marks)

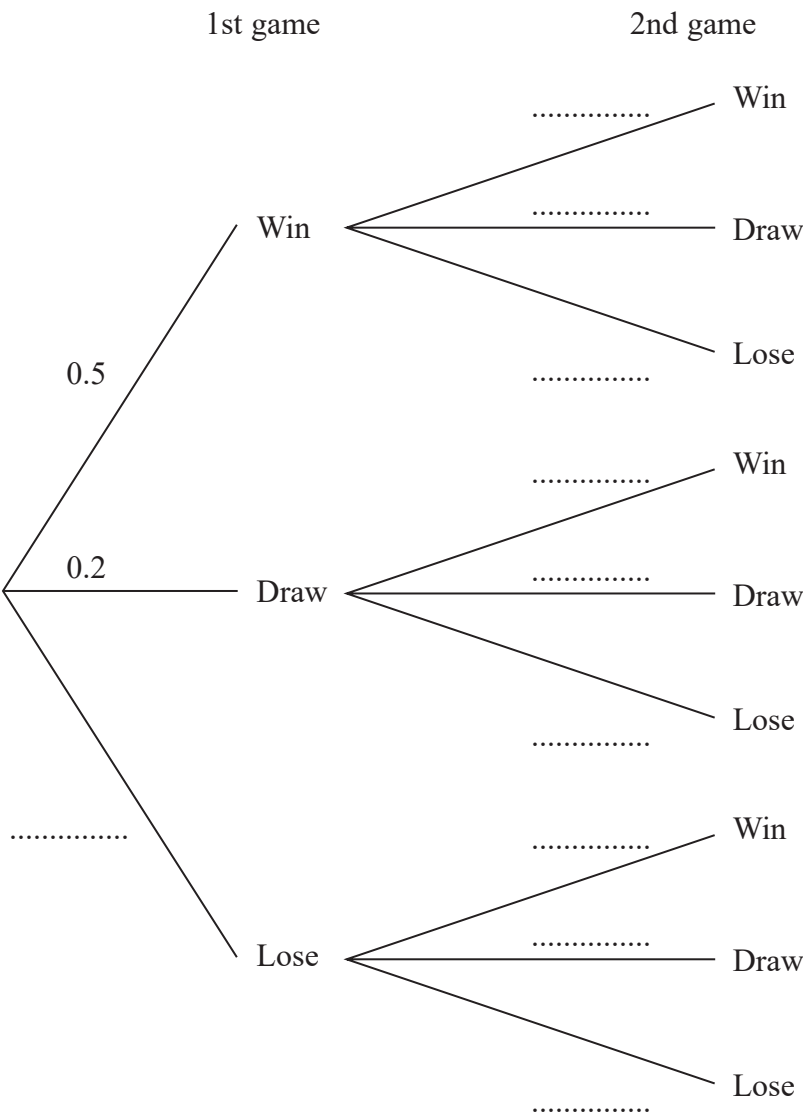
4 In a game of chess, a player can either win, draw or lose.

The probability that Sophie wins any game of chess is 0.5

The probability that Sophie draws any game of chess is 0.2

Sophie plays 2 games of chess.

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that Sophie will win both games.

.....

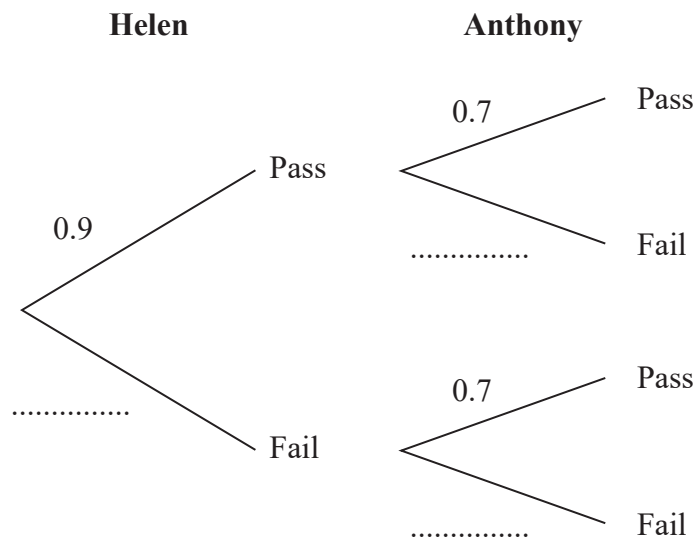
(2)

(Total for Question 4 is 4 marks)

6 Helen and Anthony each take a medical.

The probability that Helen will pass the medical is 0.9 The probability that Anthony will pass the medical is 0.7

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that both Helen and Anthony will pass the medical.

(2)

(c) Work out the probability that only one of them will pass the medical.

(3)

(Total for Question 6 is 7 marks)

7 There are 3 red sweets, 2 purple sweets and 5 orange sweets in a bag.

Georgina takes a sweet at random.

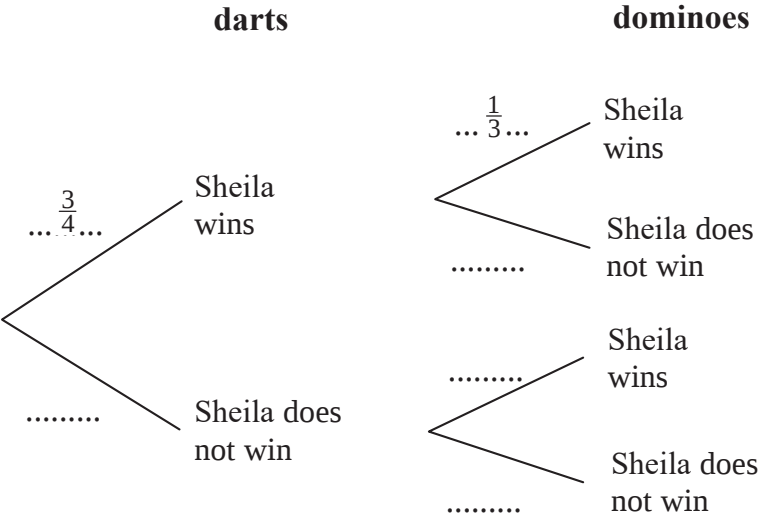
She eats the sweet.

She then takes another sweet at random.

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

.....
(Total for Question 7 is 4 marks)

- 8 Sheila is going to play one game of darts and one game of dominoes.
 The probability that she will win the game of darts is $\frac{3}{4}$
 The probability that she will win the game of dominoes is $\frac{1}{3}$
 is (a) Complete the probability tree diagram.



(2)

- (b) Work out the probability that Sheila will win **exactly** one game.

.....
 (3)

Sheila played one game of darts and one game of dominoes on a number of Fridays.
 She won at **both** darts and dominoes on 21 Fridays.

- (c) Work out an estimate for the number of Fridays on which Sheila did not win either game.

.....
 (3)

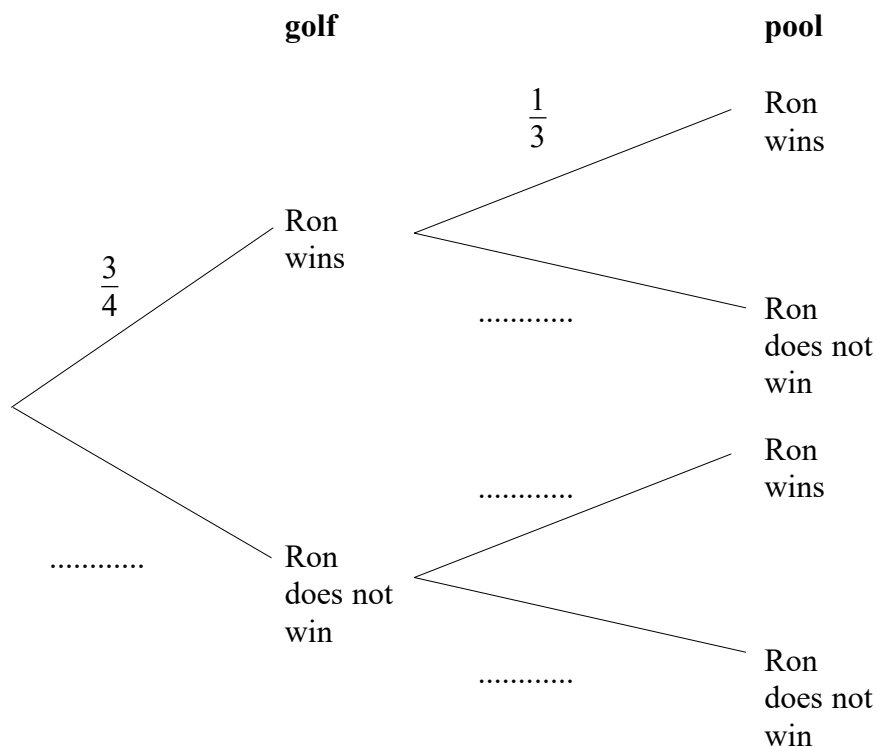
(Total for Question 8 is 8 marks)

9 Ron plays one game of golf and one game of pool.

The probability that Ron will win at golf is $\frac{3}{4}$

The probability that Ron will win at pool is $\frac{1}{3}$

(a) Complete the probability tree diagram below.



(2)

(b) Work out the probability that Ron wins both games.

.....

(2)

(c) Work out the probability that Ron will win only one game.

.....

(3)

(Total for Question 9 is 7 marks)

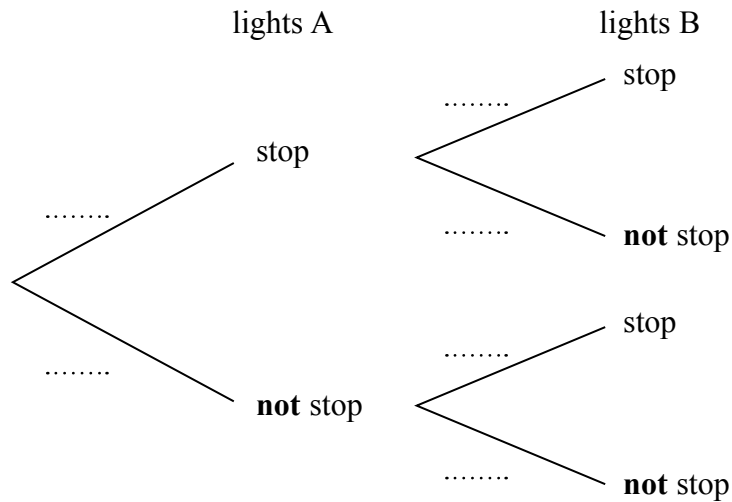
10 A and B are two sets of traffic lights on a road.

The probability that a car is stopped by lights A is 0.4

If a car is stopped by lights A, then the probability that the car is **not** stopped by lights B is 0.7

If a car is **not** stopped by lights A, then the probability that the car is **not** stopped by lights B is 0.2

(a) Complete the probability tree diagram for this information.



(2)

Derek drove along this road.

He was stopped by just one of the sets of traffic lights.

(b) Is it more likely that he was stopped by lights A or by lights B?

You must show your working.

(3)

(Total for Question 10 is 5 marks)

11

He has to jump at least 7.5 metres to qualify for the final on Saturday.

- He has up to three jumps to qualify.
- If he jumps at least 7.5 metres he does **not** jump again on Friday.

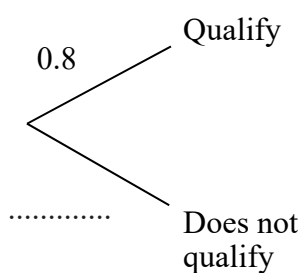
Each time Arshan jumps, the probability he jumps at least 7.5 metres is 0.8. Assume each jump is independent.

(a) Complete the tree diagram.

First jump

Second jump

Third jump



(2)

(b) Work out the probability that he does **not** need the third jump to qualify.

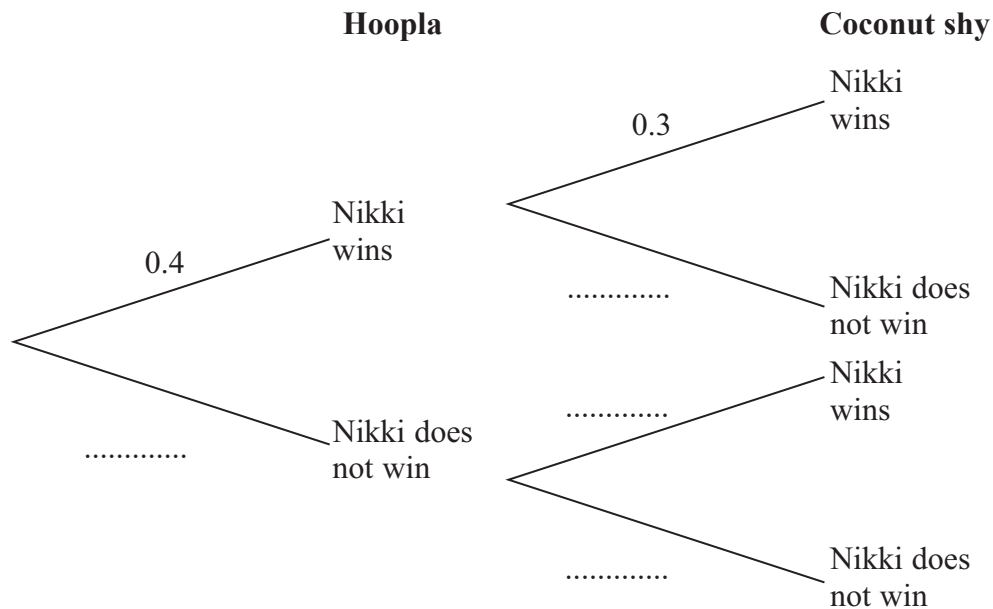
(2)

(Total for Question 11 is 4 marks)

- 12** Nikki 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 Nikki wins at Hoopla and also wins on the Coconut shy.

.....

(2)

(Total for Question 12 is 4 marks)

- 13** Noah has 10 coins in a bag.
There are three £1 coins and seven 50 pence coins.
Noah takes at random, 3 coins from the bag.
Work out the probability that he takes exactly £2.50

.....
(Total for Question 13 is 4 marks)

14 Some of the children at a nursery arrive by car.

- 40% of the children at the nursery are boys.
- 70% of the boys at the nursery arrive by car.
- 60% of the girls at the nursery arrive by car.

What is the probability that a child chosen at random from the nursery arrives by car?

.....
(5)

(Total for Question 14 is 5 marks)

- 15** Peter believes he knows what his brother John is thinking.
He carries out an experiment to test this.

Peter and John sit back-to-back.

John rolls an ordinary fair dice.

John then thinks about the number on the dice while Peter tries to predict this number.

- (a)** In 300 attempts, how many correct predictions would you expect Peter to make if he was just guessing?

(a)

(2)

- (b)** The results of the first 15 attempts are shown in the table.

John's number	2	6	5	3	2	1	5	1	3	4	4	6	1	6	5
Peter's prediction	2	4	3	1	2	6	1	6	4	3	2	6	5	2	3
Matching pair	✓				✓							✓			

Estimate the probability of getting a matching pair using the results of

- (i)** the first five attempts,

(b)(i)

(1)

- (ii)** all 15 attempts.

(ii)

(1)

- (c)** Use answers from **(a)** and **(b)** to comment on Peter's belief that he knows what John is thinking.

(2)

(Total for Question 15 is 6 marks)

16

A coin is rolled onto a grid of squares.

It lands randomly on the grid.

To win, the coin must land completely within one of the squares.

Misbah and Hamera each roll the coin a number of times and record their results.

	Number of wins	Number of losses
Misbah	6	44
Hamera	28	72

- (a) Work out **two** different estimates for the probability of winning.

..... and

(2)

- (b) Which of your estimates is the better estimate for the probability of winning?

Give a reason for your answer.

Answer

Reason

.....

.....

(1)

(Total for Question 16 is 3 marks)

17

Bag X contains 9 blue balls and 18 red balls.

Bag Y contains 7 blue balls and 14 red balls.

Helen picks a ball at random from bag X. She puts the ball into bag Y.

Matt now picks a ball at random from bag Y.

Show that:

$$P(\text{Helen picks a blue ball}) = P(\text{Matt picks a blue ball})$$

(4)

(Total for Question 17 is 4 marks)