



Maths Questions By Topic:

Probability

Edexcel GCSE (Higher)

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New Spec

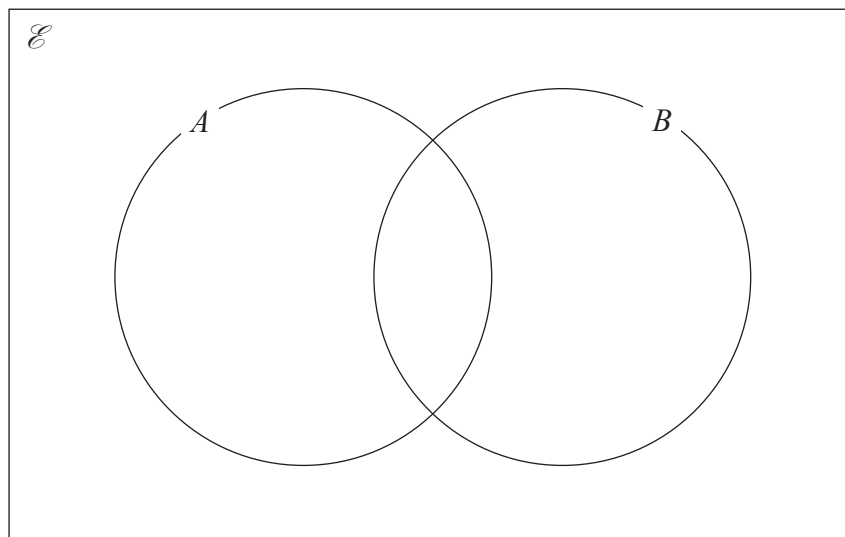
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Old Spec A (Linear)

Paper 1	Page 48
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- 1 $\mathcal{E} = \{\text{even numbers less than 19}\}$
 $A = \{6, 12, 18\}$
 $B = \{2, 6, 14, 18\}$

Complete the Venn diagram for this information.



(Total for Question 1 is 3 marks)

2 There are only 3 red counters and 5 yellow counters in a bag.

Jude takes at random 3 counters from the bag.

Work out the probability that he takes exactly one red counter.

.....
(Total for Question 2 is 4 marks)

- 3 Sally plays two games against Martin.
In each game, Sally could win, draw or lose.

In each game they play,
the probability that Sally will win against Martin is 0.3
the probability that Sally will draw against Martin is 0.1

Work out the probability that Sally will win **exactly** one of the two games against Martin.

.....
(Total for Question 3 is 3 marks)

4 There are only blue cubes, red cubes and yellow cubes in a box.

The table shows the probability of taking at random a blue cube from the box.

Colour	blue	red	yellow
Probability	0.2		

The number of red cubes in the box is the same as the number of yellow cubes in the box.

(a) Complete the table.

(2)

There are 12 blue cubes in the box.

(b) Work out the total number of cubes in the box.

.....
(2)

(Total for Question 4 is 4 marks)

5 There are only r red counters and g green counters in a bag.

A counter is taken at random from the bag.

The probability that the counter is green is $\frac{3}{7}$

The counter is put back in the bag.

2 more red counters and 3 more green counters are put in the bag.

A counter is taken at random from the bag.

The probability that the counter is green is $\frac{6}{13}$

Find the number of red counters and the number of green counters that were in the bag originally.

red counters.....

green counters.....

(Total for Question 5 is 5 marks)

6 There are only green pens and blue pens in a box.

There are three more blue pens than green pens in the box.

There are more than 12 pens in the box.

Simon is going to take at random two pens from the box.

The probability that Simon will take two pens of the same colour is $\frac{27}{55}$

Work out the number of green pens in the box.

.....
(Total for Question 6 is 6 marks)

7 " There are only red counters, blue counters and purple counters in a bag.
The ratio of the number of red counters to the number of blue counters is 3 : 17

Sam takes at random a counter from the bag.
The probability that the counter is purple is 0.2

Work out the probability that Sam takes a red counter.

.....
(Total for Question 7 is 3 marks)

8 There are 9 counters in a bag.

7 of the counters are green.

2 of the counters are blue.

Ria takes at random two counters from the bag.

Work out the probability that Ria takes one counter of each colour.

You must show your working.

.....
(Total for Question 8 is 4 marks)

9 John has an empty box.

He puts some red counters and some blue counters into the box.

The ratio of the number of red counters to the number of blue counters is 1 : 4

Linda takes at random 2 counters from the box.

The probability that she takes 2 red counters is $\frac{6}{155}$

How many red counters did John put into the box?

.....
(Total for Question 9 is 4 marks)

10 There are only red counters, blue counters, green counters and yellow counters in a bag.

The table shows the probabilities of picking at random a red counter and picking at random a yellow counter.

Colour	red	blue	green	yellow
Probability	0.24			0.32

The probability of picking a blue counter is the same as the probability of picking a green counter.

Complete the table.

(Total for Question 10 is 2 marks)

- 11 Four friends each throw a biased coin a number of times.
The table shows the number of heads and the number of tails each friend got.

	Ben	Helen	Paul	Sharif
heads	34	66	80	120
tails	8	12	40	40

The coin is to be thrown one more time.

- (a) Which of the four friends' results will give the best estimate for the probability that the coin will land heads?
Justify your answer.

.....

.....

.....

(1)

Paul says,

“With this coin you are twice as likely to get heads as to get tails.”

- (b) Is Paul correct?
Justify your answer.

.....

.....

.....

(2)

The coin is to be thrown twice.

- (c) Use all the results in the table to work out an estimate for the probability that the coin will land heads both times.

.....

(2)

(Total for Question 11 is 5 marks)

12 There are 10 pens in a box.

There are x red pens in the box.
All the other pens are blue.

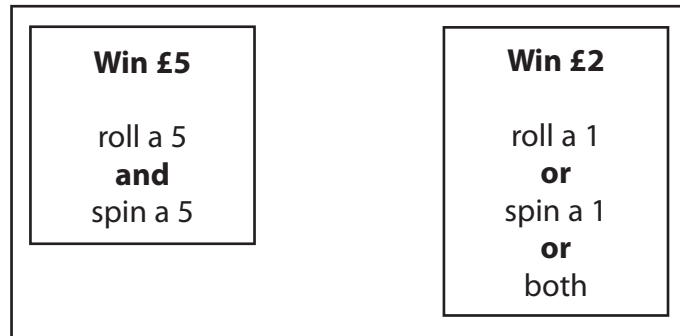
Jack takes at random two pens from the box.

Find an expression, in terms of x , for the probability that Jack takes one pen of each colour.
Give your answer in its simplest form.

.....
(Total for Question 12 is 5 marks)

13 David has designed a game.
He uses a fair 6-sided dice and a fair 5-sided spinner.
The dice is numbered 1 to 6
The spinner is numbered 1 to 5

Each player rolls the dice once and spins the spinner once.
A player can win £5 or win £2



David expects 30 people will play his game.
Each person will pay David £1 to play the game.

(a) Work out how much profit David can expect to make.

£.....
(4)

(b) Give a reason why David's actual profit may be different to the profit he expects to make.

.....
.....
(1)

(Total for Question 13 is 5 marks)

- 14 The probability that Sanay is late for school tomorrow is 0.05
The probability that Jaden is late for school tomorrow is 0.15

Alfie says that the probability that Sanay and Jaden will both be late for school tomorrow is 0.0075 because $0.05 \times 0.15 = 0.0075$

What assumption has Alfie made?

.....
.....

(Total for Question 14 is 1 mark)

15 In a village,

if it rains on one day, the probability that it will rain on the next day is 0.8

if it does **not** rain on one day, the probability that it will rain on the next day is 0.6

A weather forecaster says,

“There is a 70% chance that it will rain in the village on Monday.”

Work out an estimate for the probability that it will rain in the village on Wednesday.

You must show all your working.

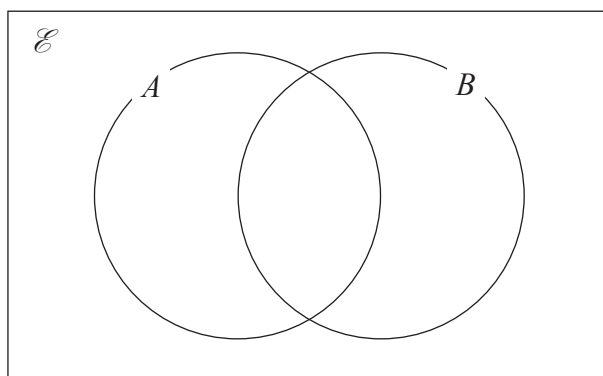
.....
(Total for Question 15 is 4 marks)

16 $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

$A = \{\text{even numbers}\}$

$B = \{\text{factors of } 10\}$

(a) Complete the Venn diagram for this information.



(3)

A number is chosen at random from the universal set, \mathcal{E}

(b) Find the probability that this number is in the set $A \cap B$

.....
(2)

(Total for Question 16 is 5 marks)

17 There are only red sweets and yellow sweets in a bag.

There are n red sweets in the bag.

There are 8 yellow sweets in the bag.

Sajid is going to take at random a sweet from the bag and eat it.

He says that the probability that the sweet will be red is $\frac{7}{10}$

(a) Show why the probability cannot be $\frac{7}{10}$

(3)

After Sajid has taken the first sweet from the bag and eaten it, he is going to take at random a second sweet from the bag.

Given that the probability that both the sweets he takes will be red is $\frac{3}{5}$

(b) work out the number of red sweets in the bag.

You must show all your working.

.....
(5)

(Total for Question 17 is 8 marks)

18 Marek has 9 cards.

There is a number on each card.



Marek takes at random two of the cards.

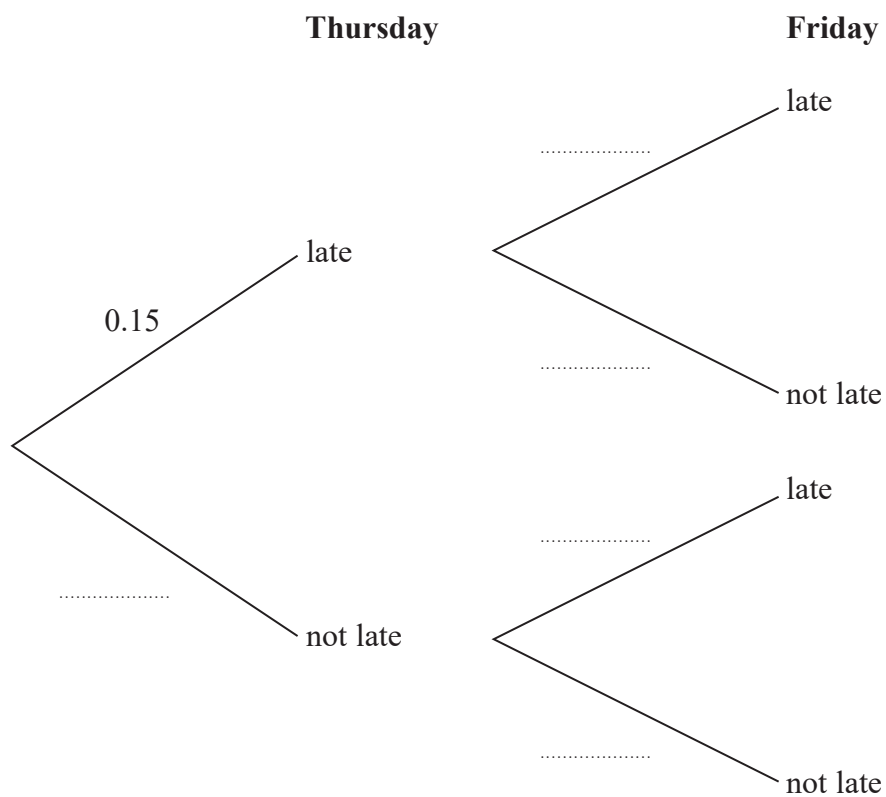
He works out the product of the numbers on the two cards.

Work out the probability that the product is an even number.

.....
(Total for Question 18 is 3 marks)

19 Mary travels to work by train every day.
 The probability that her train will be late on any day is 0.15

(a) Complete the probability tree diagram for Thursday and Friday.



(2)

(b) Work out the probability that her train will be late on at least one of these two days.

(3)

(Total for Question 19 is 5 marks)

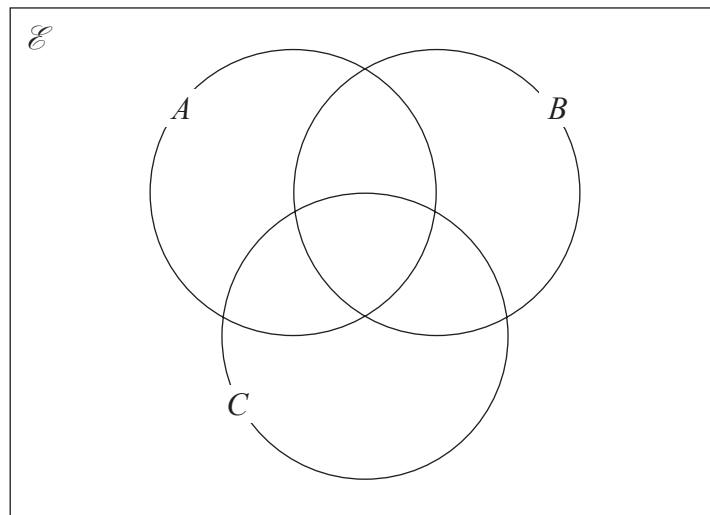
20 $\mathcal{E} = \{\text{even numbers between 1 and 25}\}$

$A = \{2, 8, 10, 14\}$

$B = \{6, 8, 20\}$

$C = \{8, 18, 20, 22\}$

(a) Complete the Venn diagram for this information.



(4)

A number is chosen at random from \mathcal{E} .

(b) Find the probability that the number is a member of $A \cap B$.

.....
(2)

(Total for Question 20 is 6 marks)

21 There are only red counters and blue counters in a bag.

Joe takes at random a counter from the bag.
The probability that the counter is red is 0.65
Joe puts the counter back into the bag.

Mary takes at random a counter from the bag.
She puts the counter back into the bag.

(a) What is the probability that Joe and Mary take counters of different colours?

.....
(2)

There are 78 red counters in the bag.

(b) How many blue counters are there in the bag?

.....
(2)

(Total for Question 21 is 4 marks)

22 60 people were asked if they prefer to go on holiday in Britain or in Spain or in Italy.

38 of the people were male.

11 of the 32 people who said Britain were female.

8 males said Italy.

12 people said Spain.

One of the females is chosen at random.

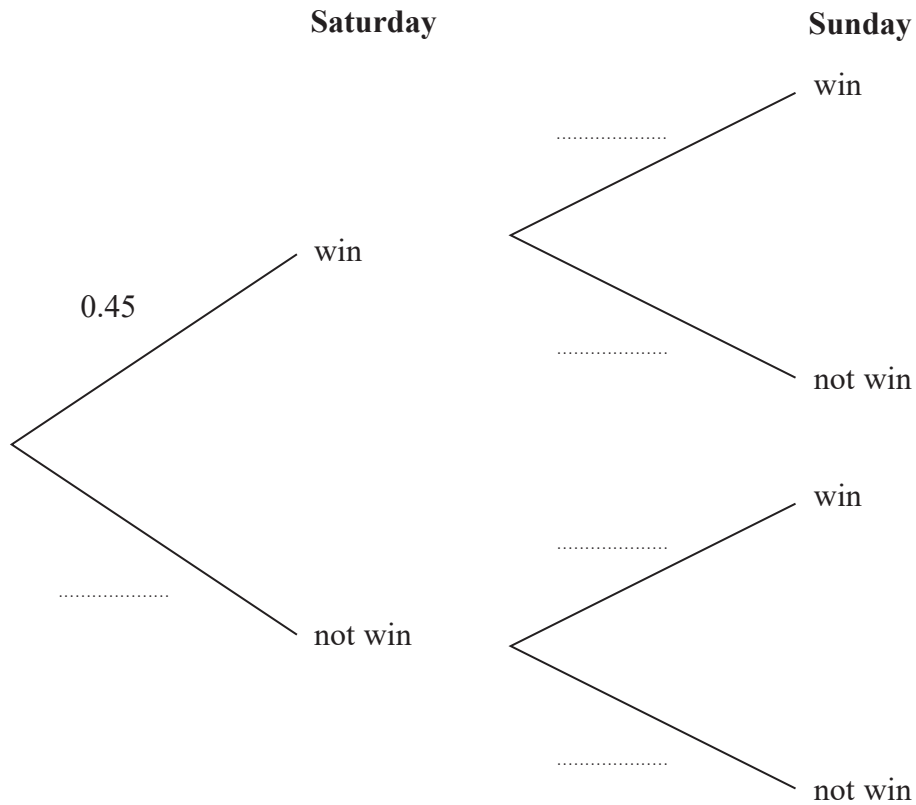
What is the probability that this female said Spain?

.....
(Total for Question 22 is 4 marks)

23 A darts team is going to play a match on Saturday and on Sunday.
 The probability that the team will win on Saturday is 0.45

If they win on Saturday, the probability that they will win on Sunday is 0.67
 If they do **not** win on Saturday, the probability that they will win on Sunday is 0.35

(a) Complete the probability tree diagram.



(2)

(b) Find the probability that the team will win exactly one of the two matches.

(3)

(Total for Question 23 is 5 marks)

24 There are 12 counters in a bag.

There is an equal number of red counters, blue counters and yellow counters in the bag.

There are no other counters in the bag.

3 counters are taken at random from the bag.

(a) Work out the probability of taking 3 red counters.

.....
(2)

The 3 counters are put back into the bag.

Some more counters are now put into the bag.

There is still an equal number of red counters, blue counters and yellow counters in the bag.

There are no counters of any other colour in the bag.

3 counters are taken at random from the bag.

(b) Is it now less likely or equally likely or more likely that the 3 counters will be red?

You must show how you get your answer.

(2)

(Total for Question 24 is 4 marks)

25 The table shows the probabilities that a biased dice will land on 2, on 3, on 4, on 5 and on 6

Number on dice	1	2	3	4	5	6
Probability		0.17	0.18	0.09	0.15	0.1

Neymar rolls the biased dice 200 times.

Work out an estimate for the total number of times the dice will land on 1 or on 3

.....
(Total for Question 25 is 3 marks)

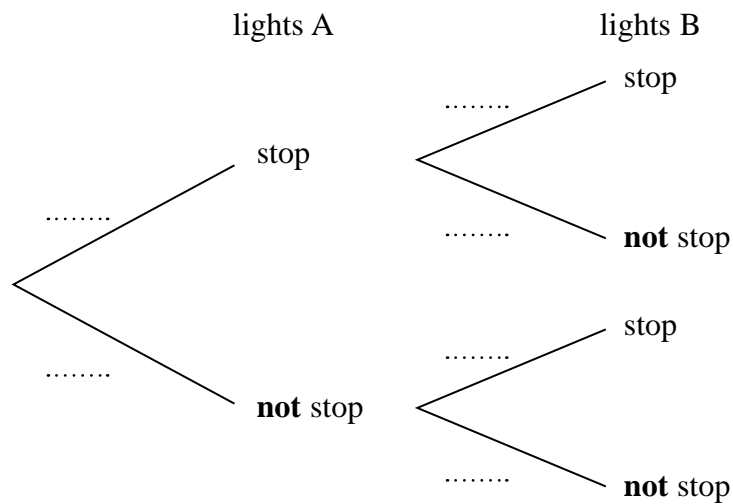
27 A and B are two sets of traffic lights on a road.

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)

Mark 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?

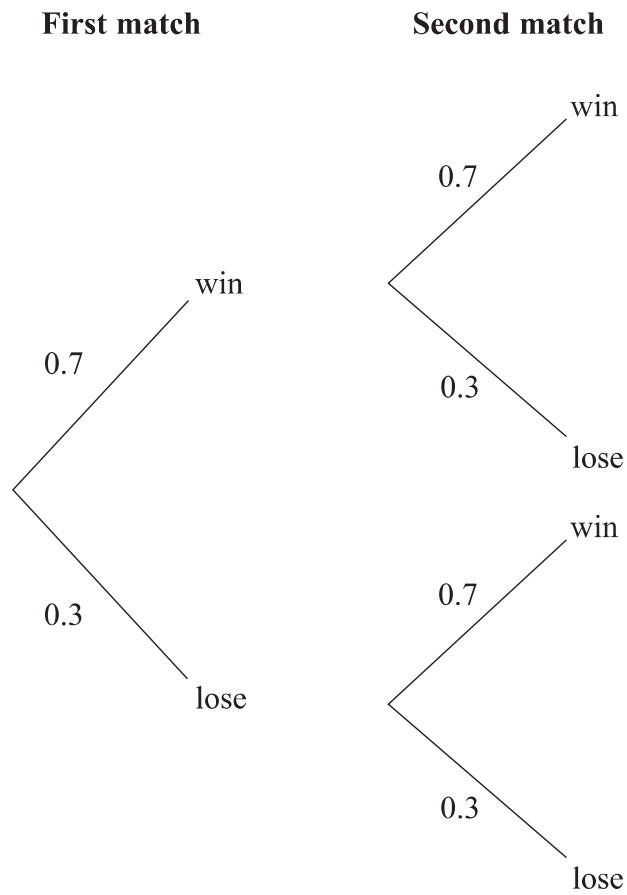
You must show your working.

(3)

(Total for Question 27 is 5 marks)

28 Finlay plays two tennis matches.

The probability that he will win a match and the probability that he will lose a match are shown in the probability tree diagram.



(a) Work out the probability that Finlay wins both matches.

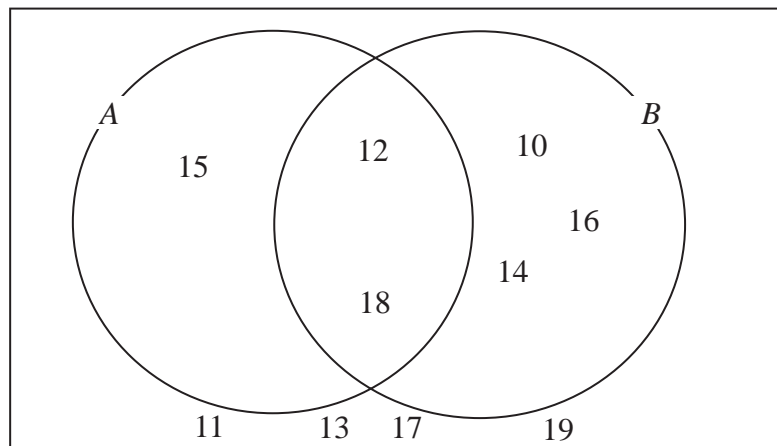
.....
(2)

(b) Work out the probability that Finlay loses at least one match.

.....
(2)

(Total for Question 28 is 4 marks)

29 Here is a Venn diagram.



(a) Write down the numbers that are in set

(i) $A \cup B$

.....

(ii) $A \cap B$

.....

(2)

One of the numbers in the diagram is chosen at random.

(b) Find the probability that the number is in set A'

.....

(2)

(Total for Question 29 is 4 marks)

30 In a bag there are only red counters, blue counters, green counters and pink counters. A counter is going to be taken at random from the bag.

The table shows the probabilities of taking a red counter or a blue counter.

Colour	red	blue	green	pink
Probability	0.05	0.15

The probability of taking a green counter is 0.2 more than the probability of taking a pink counter.

(a) Complete the table.

(2)

There are 18 blue counters in the bag.

(b) Work out the total number of counters in the bag.

.....
(2)

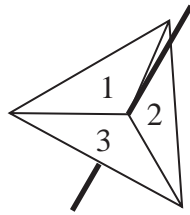
(Total for Question 30 is 4 marks)

31 Pat throws a fair coin n times.

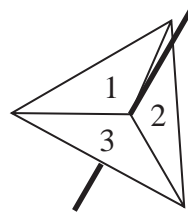
Find an expression, in terms of n , for the probability that Pat gets at least 1 head and at least 1 tail.

.....
(Total for Question 31 is 2 marks)

32 Amanda has two fair 3-sided spinners.



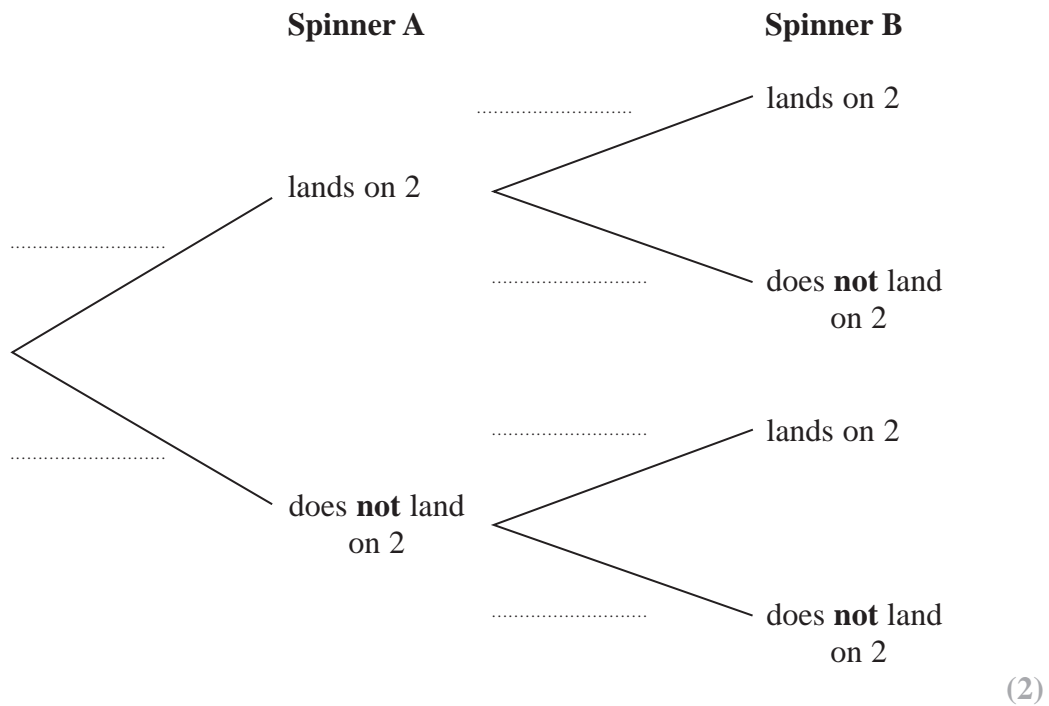
Spinner A



Spinner B

Amanda spins each spinner once.

(a) Complete the probability tree diagram.



(b) Work out the probability that Spinner A lands on 2 and Spinner B does **not** land on 2

.....
(2)

(Total for Question 32 is 4 marks)

- 33** There are some counters in a bag.
The counters are blue or green or red or yellow.

The table shows the probabilities that a counter taken at random from the bag will be blue or will be green.

Colour	blue	green	red	yellow
Probability	0.32	0.20		

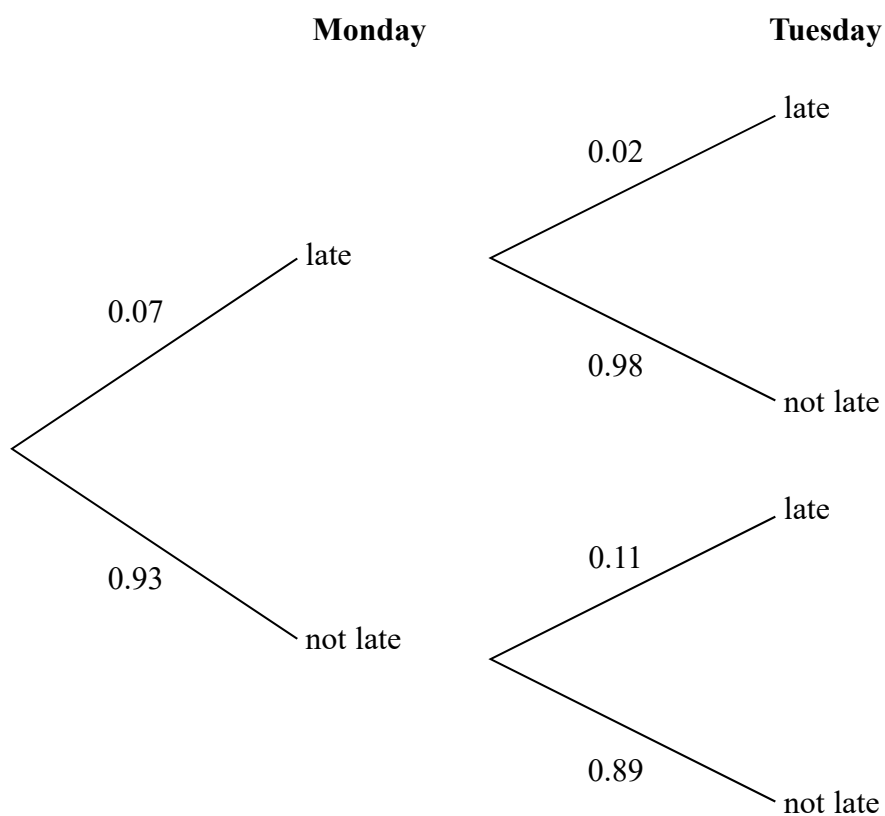
The probability that a counter taken at random from the bag will be red is five times the probability that the counter will be yellow.

There are 300 counters in the bag.

Work out the number of yellow counters in the bag.

.....
(Total for Question 33 is 3 marks)

34 The probability tree diagram shows the probabilities that Bismah will be late for work on two days next week.



Calculate the probability that Bismah will be late on exactly one of the two days.

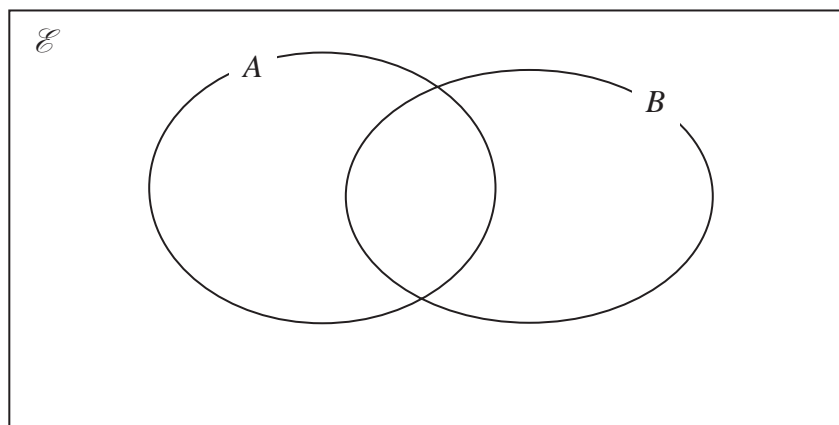
.....
(Total for Question 34 is 3 marks)

35 When a biased coin is thrown 4 times, the probability of getting 4 heads is $\frac{16}{81}$

Work out the probability of getting 4 tails when the coin is thrown 4 times.

(Total for Question 35 is 2 marks)

36 $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$
 $A = \{1, 5, 6, 8, 9\}$
 $B = \{2, 6, 9\}$



(a) Complete the Venn diagram to represent this information.

(3)

A number is chosen at random from the universal set \mathcal{E} .

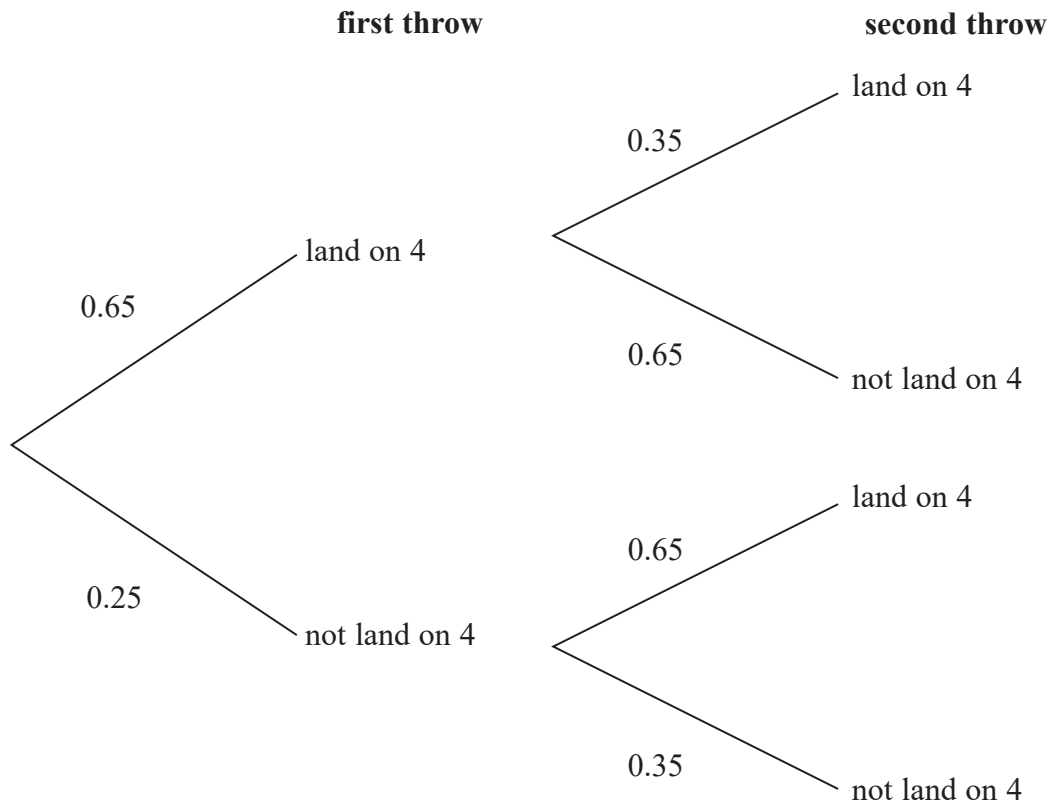
(b) Find the probability that the number is in the set $A \cap B$

(2)

(Total for Question 36 is 5 marks)

37 When a biased 6-sided dice is thrown once, the probability that it will land on 4 is 0.65
The biased dice is thrown twice.

Amir draws this probability tree diagram.
The diagram is **not** correct.



Write down **two** things that are wrong with the probability tree diagram.

1.....

.....

2.....

.....

(Total for Question 37 is 2 marks)

38 There are some counters in a bag.
The counters are red or white or blue or yellow.

Bob is going to take at random a counter from the bag.

The table shows each of the probabilities that the counter will be blue or will be yellow.

Colour	red	white	blue	yellow
Probability			0.45	0.25

There are 18 blue counters in the bag.

The probability that the counter Bob takes will be red is twice the probability that the counter will be white.

(a) Work out the number of red counters in the bag.

.....
(4)

A marble is going to be taken at random from a box of marbles.
The probability that the marble will be silver is 0.5

There must be an even number of marbles in the box.

(b) Explain why.

.....
.....
(1)

(Total for Question 38 is 5 marks)

39 50 people were asked if they speak French or German or Spanish.

Of these people,

31 speak French

2 speak French, German and Spanish

4 speak French and Spanish but not German

7 speak German and Spanish

8 do not speak any of the languages

all 10 people who speak German speak at least one other language

Two of the 50 people are chosen at random.

Work out the probability that they both only speak Spanish.

.....
(Total for Question 39 is 5 marks)

40 When a drawing pin is dropped it can land point down or point up.

Lucy, Mel and Tom each dropped the drawing pin a number of times.

The table shows the number of times the drawing pin landed point down and the number of times the drawing pin landed point up for each person.

	Lucy	Mel	Tom
point down	31	53	16
point up	14	27	9

Rachael is going to drop the drawing pin once.

- (a) Whose results will give the best estimate for the probability that the drawing pin will land point up?
Give a reason for your answer.

.....
.....
(1)

Stuart is going to drop the drawing pin twice.

- (b) Use all the results in the table to work out an estimate for the probability that the drawing pin will land point up the first time and point down the second time.

.....
(2)

.....
(Total for Question 40 is 3 marks)

- 41 There are only blue counters, yellow counters, green counters and red counters in a bag. A counter is taken at random from the bag.

The table shows the probabilities of getting a blue counter or a yellow counter or a green counter.

Colour	blue	yellow	green	red
Probability	0.2	0.35	0.4	

- (a) Work out the probability of getting a red counter.

.....
(1)

- (b) What is the least possible number of counters in the bag?
You must give a reason for your answer.

.....
.....
(2)

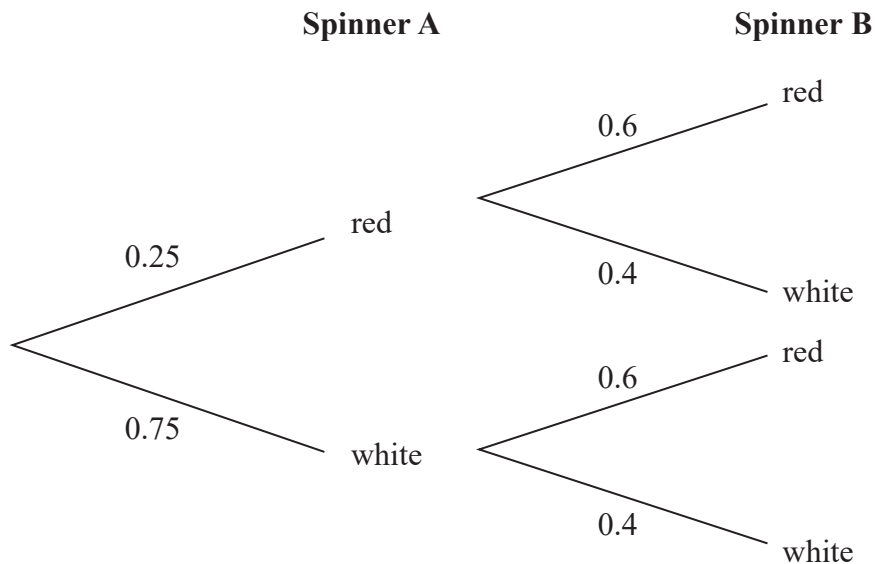
(Total for Question 41 is 3 marks)

42 Alan has two spinners, spinner **A** and spinner **B**.
Each spinner can land on only red or white.

The probability that spinner **A** will land on red is 0.25

The probability that spinner **B** will land on red is 0.6

The probability tree diagram shows this information.



Alan spins spinner **A** once and he spins spinner **B** once.
He does this a number of times.

The number of times **both** spinners land on red is 24

Work out an estimate for the number of times **both** spinners land on white.

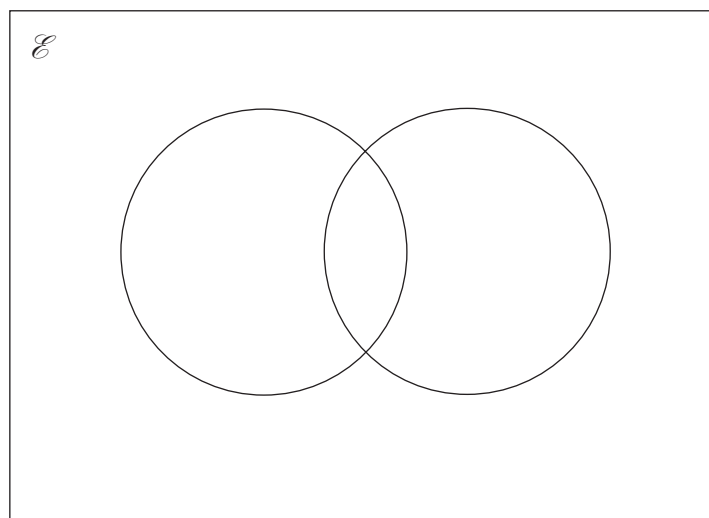
.....
(Total for Question 42 is 3 marks)

43 $\mathcal{E} = \{\text{odd numbers less than 30}\}$

$A = \{3, 9, 15, 21, 27\}$

$B = \{5, 15, 25\}$

(a) Complete the Venn diagram to represent this information.



(4)

A number is chosen at random from the universal set, \mathcal{E} .

(b) What is the probability that the number is in the set $A \cup B$?

.....
(2)

(Total for Question 43 is 6 marks)

44 The table shows some information about the dress sizes of 25 women.

Dress size	Number of women
8	2
10	9
12	8
14	6

3 of the 25 women have a shoe size of 7

Zoe says that if you choose at random one of the 25 women, the probability that she has either a shoe size of 7 or a dress size of 14 is $\frac{9}{25}$ because

$$\frac{3}{25} + \frac{6}{25} = \frac{9}{25}$$

"Is Zoe correct?"

You must give a reason for your answer.

(1)

(Total for Question 44 is 1 mark)

45 Sami asked 50 people which drinks they liked from tea, coffee and milk.

All 50 people like at least one of the drinks

19 people like all three drinks.

16 people like tea and coffee but do **not** like milk.

21 people like coffee and milk.

24 people like tea and milk.

40 people like coffee.

1 person likes only milk.

Sami selects at random one of the 50 people.

(a) Work out the probability that this person likes tea.

.....
(4)

(b) Given that the person selected at random from the 50 people likes tea, find the probability that this person also likes exactly one other drink.

.....
(2)

(Total for Question 45 is 6 marks)

- 46** Thelma spins a biased coin twice.
The probability that it will come down heads both times is 0.09
Calculate the probability that it will come down tails both times.

.....
(Total for Question 46 is 3 marks)

47 There are y black socks and 5 white socks in a drawer."

Joshua takes at random two socks from the drawer.

The probability that Joshua takes one white sock and one black sock is $\frac{6}{11}$

(a) Show that $3y^2 - 28y + 60 = 0$

(4)

(b) Find the probability that Joshua takes two black socks.

.....
(3)

(Total for Question 47 is 7 marks)

48 There are 5 girls, 6 boys and some adults in a room.
Jenny selects at random one of these people.

The probability that Jenny selects a girl is $\frac{1}{3}$

Work out the probability that Jenny selects an adult.

.....
(Total for Question 48 is 3 marks)

49 There are 7 blue counters, 3 green counters and 1 red counter in a bag.
There are no other counters in the bag.

Hubert takes at random 2 counters from the bag.

(a) Work out the probability that both counters are blue.

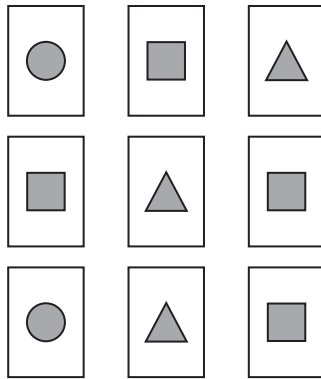
.....
(3)

(b) Work out the probability that the 2 counters are different colours.

.....
(3)

(Total for Question 49 is 6 marks)

50 Here are 9 cards.
Each card has a shape on it.



In a game the cards are turned over so that the shapes are hidden.
The cards are then mixed up.

Katie turns over at random two of the cards.

Work out the probability that these two cards have different shapes on them.
You must show all your working.

.....
(Total for Question 50 is 4 marks)

51 One of the teachers at a school is chosen at random.

The probability that this teacher is female is $\frac{3}{5}$

There are 36 **male** teachers at the school.

Work out the total number of teachers at the school.

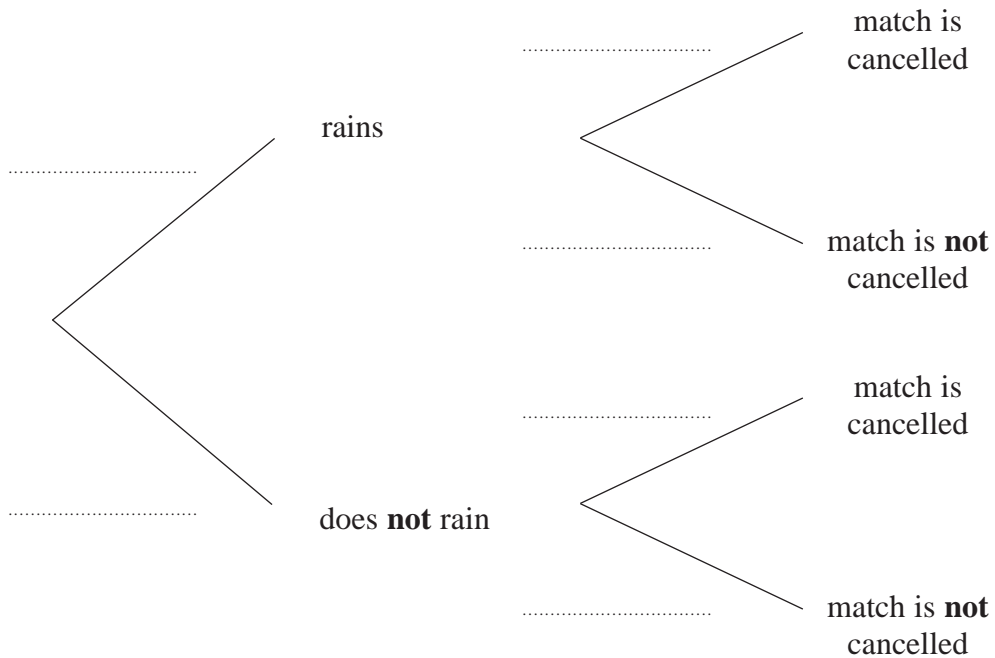
.....
(Total for Question 51 is 3 marks)

52 The probability that it will rain on a day in June is 0.2

When it rains the probability that my tennis match is cancelled is 0.7

When it does **not** rain, the probability that my tennis match is **not** cancelled is 0.95

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



(3)

(b) Work out the probability that, on a day in June, it does **not** rain and my tennis match is cancelled.

.....
(2)

(Total for Question 52 is 5 marks)

- 53** There are some black pens, some blue pens, some red pens and some green pens in a box.

The table shows the probabilities that a pen taken at random from the box will be black or will be blue or will be red.

colour	black	blue	red	green
probability	0.3	0.2	0.4	

There are 200 pens in the box.

- (a) Work out the number of black pens in the box.

.....
(2)

A pen is taken at random from the box.

- (b) Work out the probability that the pen will be green.

.....
(2)

(Total for Question 53 is 4 marks)

76 Milk is sold in $\frac{1}{2}$ pint bottles, in 1 pint bottles and in 2 pint bottles.

One weekend a shop sold 100 bottles of milk.

46 of the bottles were sold on Sunday.

15 of the bottles sold on Sunday were 2 pint bottles.

31 of the bottles sold on Saturday were $\frac{1}{2}$ pint bottles.

22 of the bottles sold were 2 pint bottles.

30 of the bottles sold were 1 pint bottles.

How many 1 pint bottles were sold on Sunday?

.....
(Total for Question 54 is 4 marks)

55 Karl wants to raise money for charity."
He designs a game for people to play.

Karl uses a fair 10-sided dice for the game.
The dice is numbered from 1 to 10

Each person will roll the dice once.
A person wins the game if the dice lands on a multiple of 4

Ali plays the game once.

(a) Work out the probability that Ali will win the game.

.....
(2)

Each person pays 30p to play the game once.
The prize for a win is £1

Karl thinks that the game will be played 100 times.

(b) Work out an estimate for how much money Karl will raise for charity.

.....
(3)

(Total for Question 55 is 5 marks)

- 56 There are n sweets in a bag.
6 of the sweets are orange.
The rest of the sweets are yellow.

Hannah takes at random a sweet from the bag.
She eats the sweet.

Hannah then takes at random another sweet from the bag.
She eats the sweet.

The probability that Hannah eats two orange sweets is $\frac{1}{3}$

- (a) Show that $n^2 - n - 90 = 0$

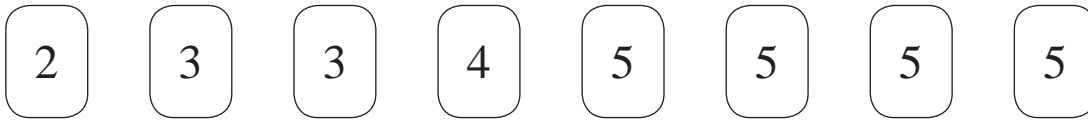
(3)

- (b) Solve $n^2 - n - 90 = 0$ to find the value of n .

.....
(3)

(Total for Question 56 is 6 marks)

57 Paul has 8 cards.
There is a number on each card.



Paul takes at random 3 of the cards.
He adds together the 3 numbers on the cards to get a total T .

Work out the probability that T is an odd number.

.....
(Total for Question 57 is 4 marks)

58 Yvonne has 10 tulip bulbs in a bag.

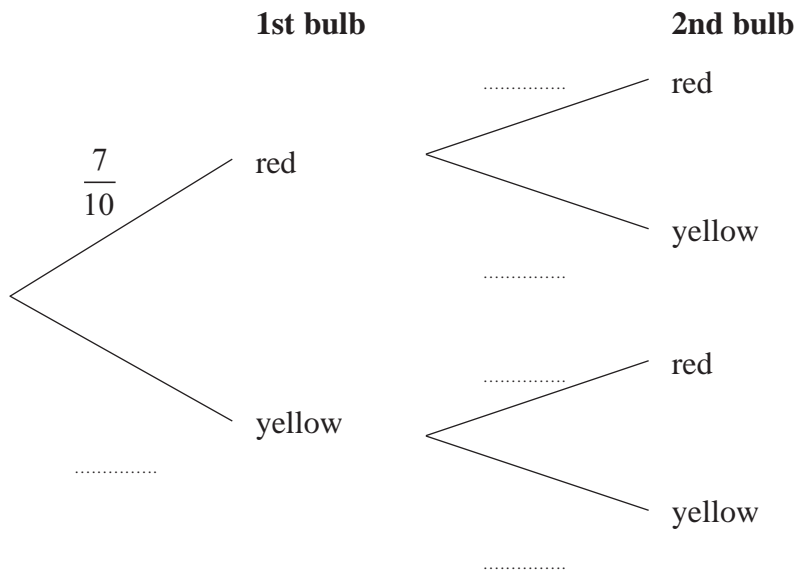
7 of the tulip bulbs will grow into red tulips.

3 of the tulip bulbs will grow into yellow tulips.

Yvonne takes at random two tulip bulbs from the bag.

She plants the bulbs.

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that at least one of the bulbs will grow into a yellow tulip.

.....
(3)

(Total for Question 58 is 5 marks)

59 Jane has a packet of seeds.
The probability that a seed will grow is 0.75

(a) What is the probability that a seed will **not** grow?

.....
(1)

Jane plants 200 of these seeds.

(b) Estimate the number of the seeds that will grow.

.....
(2)

(Total for Question 59 is 3 marks)

60 In a supermarket, the probability that John buys fruit is 0.7

In the same supermarket, the probability that John independently buys vegetables is 0.4

Work out the probability that John buys fruit or buys vegetables or buys both.

.....
(Total for Question 60 is 3 marks)

61 Fiza has 10 coins in a bag.
There are three £1 coins and seven 50 pence coins.
Fiza takes at random, 3 coins from the bag.
Work out the probability that she takes exactly £2.50

.....
(Total for Question 61 is 4 marks)

62 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.

.....
(Total for Question 62 is 5 marks)

63 There are only red counters, blue counters, white counters and black counters in a bag.

The table shows the probability that a counter taken at random from the bag will be red or blue.

Colour	red	blue	white	black
Probability	0.2	0.5		

The number of white counters in the bag is the same as the number of black counters in the bag.

Tania takes at random a counter from the bag.

(a) Work out the probability that Tania takes a white counter.

.....
(2)

There are 240 counters in the bag.

(b) Work out the number of red counters in the bag.

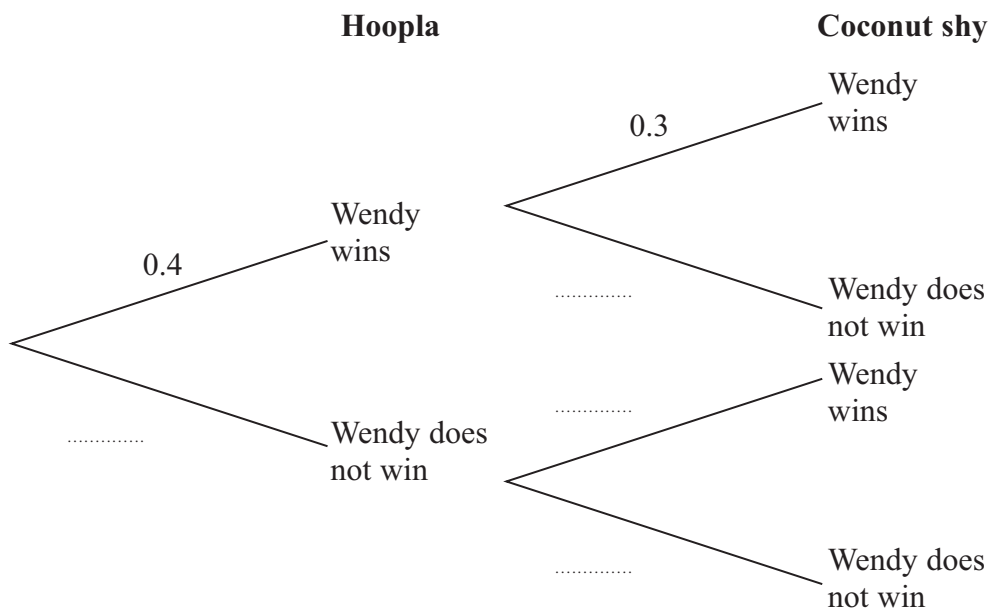
.....
(2)

(Total for Question 63 is 4 marks)

64 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.

(2)

(Total for Question 64 is 4 marks)

87" A bag contains only red, yellow and blue discs.

The probability of drawing a red disc at random is $\frac{1}{2}$

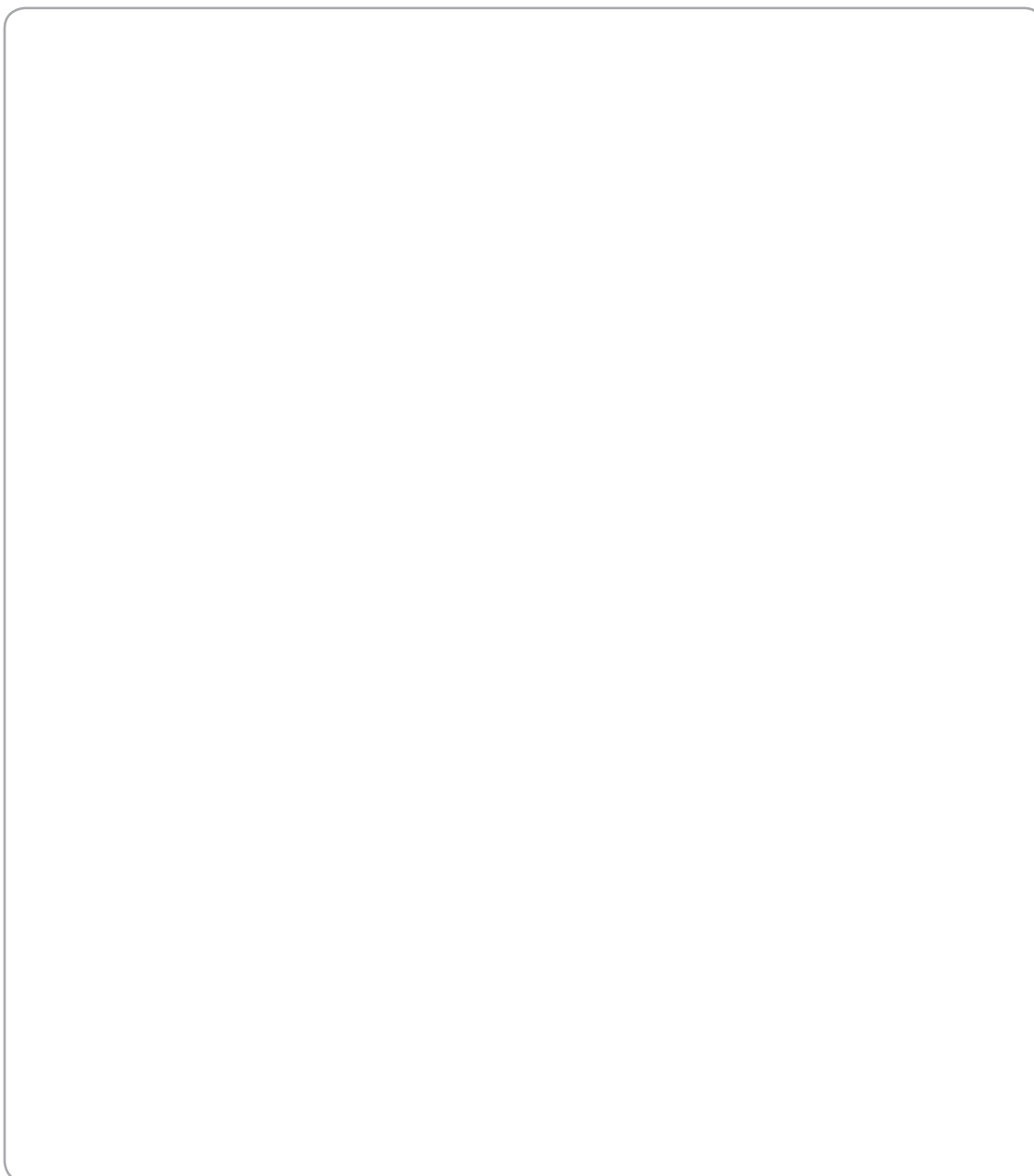
The probability of drawing a yellow disc at random is x

The probability of drawing a blue disc at random is $4x$

One disc is to be selected at random.

Work out the probability that it will be a blue disc.

Give your answer as a numerical value.



.....
(Total for Question 65 is 3 marks)



The diagram represents 100 cards. Each card has a whole number from 1 to 100 on it. No cards have the same number.

Bill puts a red dot on every card which has a multiple of 6 on it.

Parul puts a green dot on every card which has a multiple of 9 on it.

All the cards are placed in a bag.

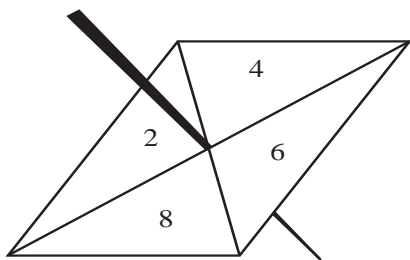
Vicki selects a card is selected at random.

What is the probability that the card has both a red and a green dot on it?

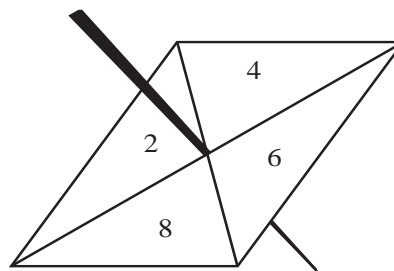
.....

(Total for Question 66 is 3 marks)

67"Here are two fair 4-sided spinners.
One is a Blue spinner and one is a Red spinner.



Blue spinner



Red spinner

Each spinner has four sections numbered 2, 4, 6 and 8

Each spinner is to be spun once.

Total score = Blue spinner score + Red spinner score

(a) Find the probability that the total score will be 10

(3)

.....

Ali and Shazia play a game.

In each round of the game, Ali spins the Blue spinner once and Shazia spins the Red spinner once.

Ali wins when the Blue spinner score is greater than the Red spinner score.

Ali and Shazia play 80 rounds.

(b) Work out an estimate of the number of rounds that Ali will win.

(3)

.....
(Total for Question 67 is 6 marks)

68 There are 10 students in a class.

" 6 of the students are boys and 4 of the students are girls.

" Three students are picked at random from the class to form a team."

" Work out the probability that the team consists of 1 girl and 2 boys.

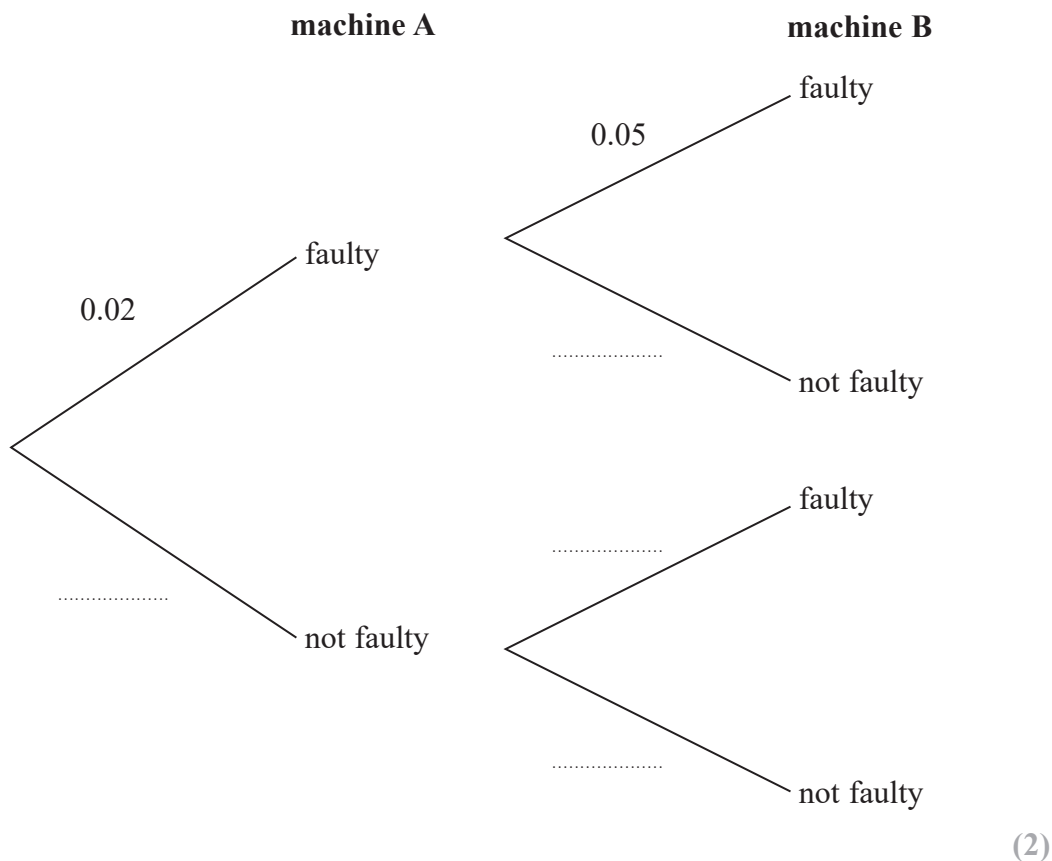
.....
(Total for Question 68 is 4 marks)

69 Machine A and machine B make bottles.

The probability that a bottle made by machine A is faulty is 0.02

The probability that a bottle made by machine B is faulty is 0.05

(a) Complete the probability tree diagram.



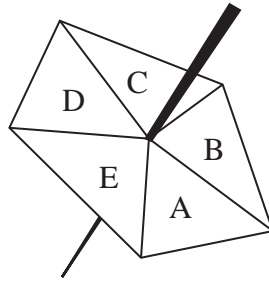
Shazia takes at random one bottle made by machine A and one bottle made by machine B.

(b) Work out the probability that at least one of these bottles is faulty.

.....
(3)

(Total for Question 69 is 5 marks)

70 Here is a five-sided spinner.



The table shows the probabilities that the spinner will land on A or on B or on C or on D.

Letter	A	B	C	D	E
Probability	0.25	0.10	0.20	0.15	

Kirsty spins the spinner once.

(a) Work out the probability that the spinner will land on E.

.....
(2)

Chris is going to spin the spinner 60 times.

(b) Work out an estimate for the number of times the spinner will land either on A or on B.

.....
(3)

(Total for Question 70 is 5 marks)

71 Chloe recorded the test marks of 20 students.

22	29	38	16	36	18	30	21	27	43
14	41	25	38	46	19	48	34	23	46

One of these students is going to be chosen at random.

Find the probability that this student has a test mark less than 28

.....
(2)

(Total for Question 71 is 2 marks)

- 72 There are only blue counters, green counters, red counters and yellow counters in a bag. Olga is going to take at random a counter from the bag.

The table shows the probability that Olga will take a blue counter and the probability that she will take a yellow counter.

Colour	blue	green	red	yellow
Probability	0.4			0.15

The number of red counters in the bag is 4 times the number of green counters in the bag.

Complete the table.

(Total for Question 72 is 3 marks)

73 Nomusa has 30 sweets.

She has

18 fruit sweets

7 aniseed sweets

5 mint sweets

Nomusa is going to take at random two sweets.

Work out the probability that the two sweets will **not** be the same type of sweet.

You must show all your working.

.....
(Total for Question 73 is 4 marks)

74 Udit has a bag of chocolate sweets.

There are 30 sweets in the bag.

This table shows the types of sweets in the bag.

	Strawberry	Caramel	Nut
Dark chocolate	3	1	6
Milk chocolate	4	5	2
White chocolate	1	4	4

Udit takes at random a sweet from the bag.

(a) Write down the probability that the sweet is a dark chocolate caramel.

.....
(1)

(b) Work out the probability that the sweet is a white chocolate.

.....
(2)

There are some dark chocolates, some milk chocolates and some white chocolates in a box.

The table below shows the probabilities that a chocolate taken at random from the box is a dark chocolate or is a milk chocolate.

	Dark chocolate	Milk chocolate	White chocolate
Probability	0.35	0.17	

A chocolate is taken at random from the box.

(c) Work out the probability that the chocolate is a white chocolate.

.....
(2)

(Total for Question 74 is 5 marks)

- 75 There are some green counters, some yellow counters, some blue counters and some red counters in a bag.

The table shows the probabilities that a counter taken at random from the bag will be green or yellow or red.

Colour	Green	Yellow	Blue	Red
Probability	0.16	0.4		0.24

Mary takes at random a counter from the bag.

- (a) Work out the probability that the counter will be blue.

.....
(2)

Mary puts the counter back into the bag.

There are 125 counters in the bag.

- (b) Work out the number of green counters in the bag.

.....
(2)

(Total for Question 75 is 4 marks)

77 Lorna carries out a survey about the number of times customers go to a shop. She asks at random 100 customers how many times they went to the shop last month. The table shows Lorna's results.

Number of times	0	1	2	3	4	5	6	more than 6
Frequency	4	12	13	17	25	13	11	5

One of the 100 customers is chosen at random.

What is the probability that this customer went to the shop 5 or more times?

.....
(2)

(Total for Question 77 is 2 marks)

***78** Shabeen has a biased coin.
The probability that the coin will land on heads is 0.6

Shabeen is going to throw the coin 3 times.

She says the probability that the coin will land on tails 3 times is less than 0.1

Is Shabeen correct?

You must show all your working.

(Total for Question 78 is 3 marks)

79 Bill has some counters in a bag.

3 of the counters are red.

7 of the counters are blue.

The rest of the counters are yellow.

Bill takes at random a counter from the bag.

The probability that he takes a yellow counter is $\frac{2}{7}$

How many yellow counters are in the bag before Bill takes a counter?

.....
(Total for Question 79 is 2 marks)

80 Rhiana plays a game.

The probability that she will lose the game is 0.32

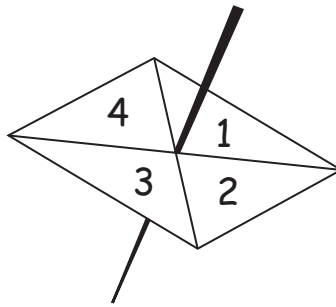
The probability that she will draw the game is 0.05

Rhiana is going to play the game 200 times.

Work out an estimate for the number of times Rhiana will win the game.

.....
(Total for Question 80 is 3 marks)

- 81 Here is a four sided spinner.
The spinner is biased.



The table shows the probabilities that the spinner will land on 1 or on 3

Number	1	2	3	4
Probability	0.2		0.1	

The probability that the spinner will land on 2 is the same as the probability that the spinner will land on 4

- (a) Work out the probability that the spinner will land on 4

.....
(3)

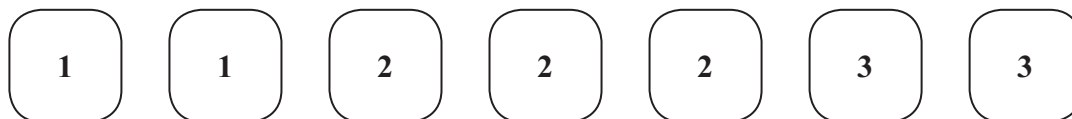
Shunya is going to spin the spinner 200 times.

- (b) Work out an estimate for the number of times the spinner will land on 3

.....
(2)

(Total for Question 81 is 5 marks)

82 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.

.....
(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.

.....
(3)

(Total for Question 82 is 5 marks)

83 The probability that a biased dice will land on a five is 0.3

Megan is going to roll the dice 400 times.

Work out an estimate for the number of times the dice will land on a five.

.....
(Total for Question 83 is 2 marks)

84 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.

.....
(Total for Question 84 is 4 marks)