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EDEXCEL GCSE (9-1) MATHS: QUESTIONS BY TOPIC

Probability (P1)

GCSE (9-1) Mathematics (1MA1) · Foundation tier

78 questions · 268 marks · Mark schemes included

Past papers June 2017 - June 2025 · 4 sub-topics

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HOW TO USE THIS BOOKLET

Questions are grouped by sub-topic and run from the lowest to the highest mark tariff, then oldest paper first.

Click any row below to jump straight to that sub-topic or question.

On every question page, click ANSWER in the top-right corner to jump to its mark scheme; < QUESTION brings you back.

A gold bar in the left margin marks exactly where the question sits on the original page.

Diagrams, graphs, grids and tables are printed exactly as they appear in the original papers.

Each question is filed under its main topic; longer questions may also test skills from other topics.

QUESTION	SOURCE	MARKS	PAGE
P1a BASIC PROBABILITY & EXPECTED OUTCOMES		42 Qs · 126 marks	4
1. Q7	GCSE Paper 2F June 2017	1	5
2. Q11	GCSE Paper 2F June 2024	1	6
3. Q6	GCSE Paper 1F June 2017	2	7
4. Q12	GCSE Paper 1F June 2017	2	8
5. Q13	GCSE Paper 2F June 2018	2	9
6. Q12	GCSE Paper 2F November 2018	2	10
7. Q6	GCSE Paper 3F November 2018	2	11
8. Q17	GCSE Paper 1F June 2019	2	12
9. Q7	GCSE Paper 3F June 2019	2	13
10. Q6	GCSE Paper 1F November 2020	2	14
11. Q21	GCSE Paper 3F November 2020	2	15
12. Q13	GCSE Paper 1F June 2022	2	16
13. Q23	GCSE Paper 1F November 2022	2	17
14. Q6	GCSE Paper 2F June 2023	2	18
15. Q11	GCSE Paper 2F November 2023	2	19
16. Q21	GCSE Paper 3F November 2023	2	20
17. Q7	GCSE Paper 3F June 2025	2	21
18. Q17	GCSE Paper 2F June 2017	3	22
19. Q19	GCSE Paper 2F November 2017	3	23
20. Q26	GCSE Paper 3F November 2017	3	24
21. Q15	GCSE Paper 3F November 2018	3	25
22. Q16	GCSE Paper 3F November 2020	3	26
23. Q8	GCSE Paper 2F November 2021	3	27
24. Q7	GCSE Paper 1F November 2022	3	28
25. Q15	GCSE Paper 2F June 2023	3	29
26. Q7	GCSE Paper 3F June 2023	3	30
27. Q9	GCSE Paper 1F November 2023	3	31
28. Q13	GCSE Paper 1F June 2024	3	32
29. Q14	GCSE Paper 2F November 2018	4	33
30. Q14	GCSE Paper 3F November 2018	4	34
31. Q22	GCSE Paper 1F June 2019	4	35
32. Q16	GCSE Paper 3F November 2019	4	36
33. Q26	GCSE Paper 3F November 2021	4	37
34. Q10	GCSE Paper 3F June 2022	4	38



QUESTION	SOURCE	MARKS	PAGE
35. Q23	GCSE Paper 2F June 2024	4	39
36. Q19	GCSE Paper 1F November 2024	4	40
37. Q15	GCSE Paper 2F June 2025	4	41
38. Q7	GCSE Paper 1F June 2018	5	42
39. Q24	GCSE Paper 3F June 2018	5	43
40. Q16	GCSE Paper 2F June 2019	5	44
41. Q17	GCSE Paper 1F November 2022	5	45
42. Q20	GCSE Paper 1F June 2025	5	46
P1b	SAMPLE SPACES, TWO-WAY TABLES & LISTING	20 Qs · 77 marks	47
43. Q17	GCSE Paper 1F November 2017	2	48
44. Q7	GCSE Paper 3F November 2021	2	49
45. Q14	GCSE Paper 2F June 2018	3	50
46. Q14	GCSE Paper 1F November 2020	3	51
47. Q9	GCSE Paper 3F November 2021	3	52
48. Q13	GCSE Paper 2F June 2022	3	53
49. Q23	GCSE Paper 3F November 2022	3	54
50. Q12	GCSE Paper 2F June 2025	3	55
51. Q12	GCSE Paper 1F November 2017	4	56
52. Q21	GCSE Paper 1F June 2019	4	57
53. Q15	GCSE Paper 1F November 2019	4	58
54. Q16	GCSE Paper 2F November 2023	4	59
55. Q17	GCSE Paper 3F June 2025	4	60
56. Q12	GCSE Paper 2F November 2017	5	61
57. Q17	GCSE Paper 1F November 2018	5	62
58. Q17	GCSE Paper 2F November 2021	5	63
59. Q17	GCSE Paper 1F June 2022	5	64
60. Q19	GCSE Paper 2F June 2023	5	65
61. Q15	GCSE Paper 3F November 2023	5	66
62. Q11	GCSE Paper 1F November 2024	5	67
P1c	VENN DIAGRAMS & SET NOTATION	7 Qs · 34 marks	68
63. Q23	GCSE Paper 1F June 2024	3	69
64. Q20	GCSE Paper 3F November 2019	4	70
65. Q24	GCSE Paper 3F June 2019	5	71
66. Q22	GCSE Paper 2F November 2020	5	72
67. Q24	GCSE Paper 1F June 2023	5	73
68. Q15	GCSE Paper 3F June 2017	6	74
69. Q20	GCSE Paper 2F November 2018	6	75
P1d	TREE DIAGRAMS, COMBINED & CONDITIONAL PROBABILITY	9 Qs · 31 marks	76
70. Q22	GCSE Paper 3F June 2018	2	77
71. Q31	GCSE Paper 1F June 2023	2	78
72. Q16	GCSE Paper 2F November 2024	3	79



QUESTION	SOURCE	MARKS	PAGE
73. Q27	GCSE Paper 1F November 2018	4	80
74. Q27	GCSE Paper 3F November 2020	4	81
75. Q20	GCSE Paper 2F June 2022	4	82
76. Q26	GCSE Paper 3F November 2022	4	83
77. Q27	GCSE Paper 3F June 2024	4	84
78. Q20	GCSE Paper 3F November 2024	4	85



QUESTIONS

78 questions · 268 marks · 4 sub-topics

SUB-TOPIC P1a

BASIC PROBABILITY & EXPECTED OUTCOMES

Sub-topic P1a · 42 questions · 126 marks · lowest tariff first



- 7 The probability that a new fridge has a fault is 0.015

What is the probability that a new fridge does **not** have a fault?

.....
(Total for Question 7 is 1 mark)

- 8 Here is a list of numbers.

21 22 23 24 25 26 27 28 29

- (a) From the numbers in the list, write down a square number.

.....
(1)

- (b) From the numbers in the list, write down a number that is a multiple of **both** 4 and 6

.....
(1)

- (c) Write down all the prime numbers in the list.

.....
(1)

(Total for Question 8 is 3 marks)

- 10 Anita throws a coin 3 times.
Each time the coin can land on heads (H) or tails (T).

List all the possible outcomes.

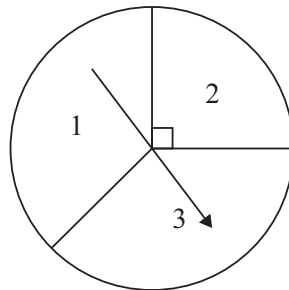
.....

.....

.....

(Total for Question 10 is 2 marks)

- 11 Majid has a spinner.



Majid is going to spin the arrow.
The arrow can land on 1 or on 2 or on 3

Majid says,

“The probability that the arrow will land on 2 is $\frac{1}{3}$ because the spinner has three sections.”

Is Majid correct?
You must give a reason for your answer.

.....

.....

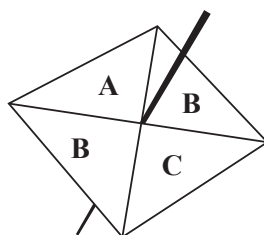
.....

(Total for Question 11 is 1 mark)

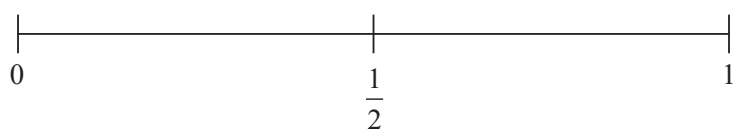
5 Work out 60% of 70

(Total for Question 5 is 2 marks)

6 Sammy spins a fair 4-sided spinner.

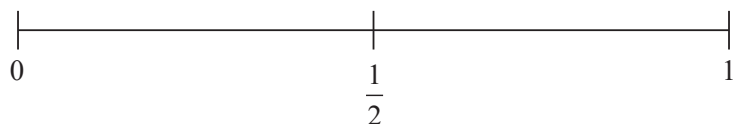


- (i) On the probability scale, mark with a cross (×) the probability that the spinner will land on **B**.



(1)

- (ii) On the probability scale, mark with a cross (×) the probability that the spinner will land on **F**.



(1)

(Total for Question 6 is 2 marks)

- 12 There are only 7 blue pens, 4 green pens and 6 red pens in a box.

One pen is taken at random from the box.

Write down the probability that this pen is blue.

(Total for Question 12 is 2 marks)

- 13 The diagram shows a tree and a man.



The man is of average height.

The tree and the man are drawn to the same scale.

- (a) Write down an estimate for the real height, in metres, of the man.

..... metres
(1)

- (b) Find an estimate for the real height, in metres, of the tree.

..... metres
(2)

(Total for Question 13 is 3 marks)

- 13 A scout group has a raffle to raise money for charity.
There is 1 prize to be won in the raffle.

Laura buys 12 raffle tickets.

A total of 350 raffle tickets are sold.

Find the probability that Laura does **not** win the prize.

(Total for Question 13 is 2 marks)



- 11 Adam gets a bonus of 30% of £80
Katy gets a bonus of £28

Work out the difference between the bonus Adam gets and the bonus Katy gets.

£

(Total for Question 11 is 3 marks)

- 12 There are 49 counters in a bag.

20 of the counters are red.
The rest of the counters are blue.

One of the counters is taken at random.

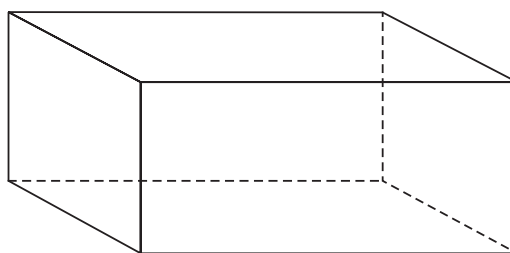
Find the probability that the counter is blue.

.....

(Total for Question 12 is 2 marks)



5 Here is a 3-D shape.



(a) Write down the name of this 3-D shape.

.....
(1)

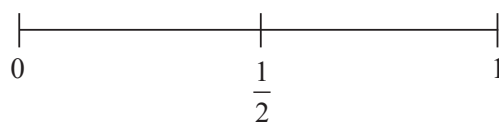
(b) Write down the number of edges of this 3-D shape.

.....
(1)

(Total for Question 5 is 2 marks)

6 An ordinary fair dice is thrown once.

(a) On the probability scale below, mark with a cross (×) the probability that the dice lands on an odd number.



.....
(1)

(b) Write down the probability that the dice lands on a number greater than 4

.....
(1)

(Total for Question 6 is 2 marks)

17 Stuart throws a biased coin 10 times.
He gets 7 Tails.

Maxine throws the same coin 50 times.
She gets 30 Tails.

Prasha is going to throw the coin once.

- (i) Whose results will give the better estimate for the probability that she will get Tails, Stuart's or Maxine's?
You must give a reason for your answer.

(1)

- (ii) Use Stuart's and Maxine's results to work out an estimate for the probability that Prasha will get Tails.

(1)

(Total for Question 17 is 2 marks)



- 6 Work out 20% of 80

(Total for Question 6 is 2 marks)

- 7 There are four types of counter in a bag.

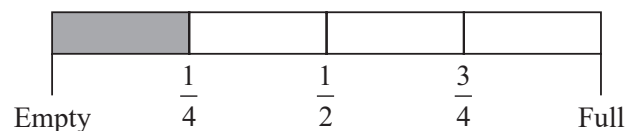
The table shows the number of each type of counter in the bag.

Type of counter	red circle	green circle	red square	green square
Number of counters	16	26	11	7

There are more green counters than red counters.
How many more?

(Total for Question 7 is 2 marks)

- 8 Here is the gauge for the fuel tank of a car.



The fuel tank holds 52 litres of fuel when the tank is full.

The tank is $\frac{1}{4}$ full of fuel.

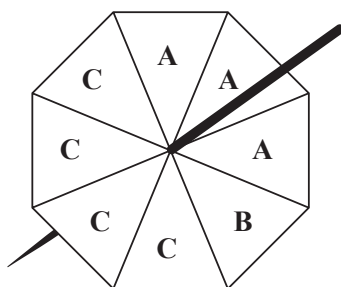
Work out how many more litres of fuel are needed to fill the tank.

..... litres

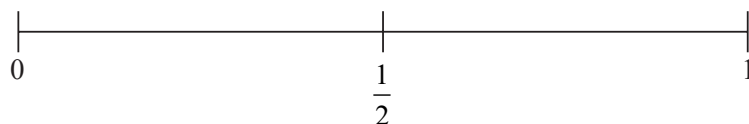
(Total for Question 8 is 3 marks)



- 6 Gita spins a fair 8-sided spinner.

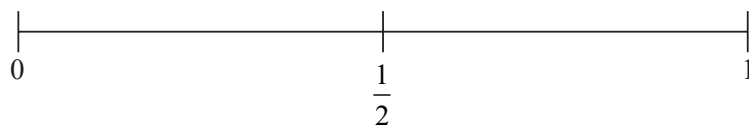


- (a) On the probability scale, mark with a cross (×) the probability that the spinner will land on C.



(1)

- (b) On the probability scale, mark with a cross (×) the probability that the spinner will land on D.



(1)

(Total for Question 6 is 2 marks)

21 Malik is going to throw a fair coin 50 times.

(a) Write down an estimate for the number of times the coin will land on heads.

.....
(1)

Paula and Simon are trying to find out if a different coin is biased.

Paula throws this coin 10 times.

She records the number of times the coin lands on heads.

Simon throws the same coin 100 times.

He records the number of times the coin lands on heads.

(b) Whose results will be more useful in deciding if the coin is biased?

Give a reason for your answer.

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

(Total for Question 21 is 2 marks)



- 13** There are 15 sweets in a jar.
4 of the sweets are red.

Jill takes at random a sweet from the jar.

- (a) Write down the probability that the sweet is red.

.....
(1)

There are only green counters and blue counters in a bag.

A counter is taken at random from the bag.
The probability that the counter is green is 0.3

- (b) Find the probability that the counter is blue.

.....
(1)

(Total for Question 13 is 2 marks)

- 14** $y = 6x - 5$

Work out the value of y when $x = 4$

$y =$

(Total for Question 14 is 2 marks)



23 A car factory is going to make four different car models **A**, **B**, **C** and **D**.

80 people are asked which of the four models they would be most likely to buy.

The table shows information about the results.

Car model	Number of people
A	23
B	15
C	30
D	12

The factory is going to make 40 000 cars next year.

Work out how many model **B** cars the factory should make next year.

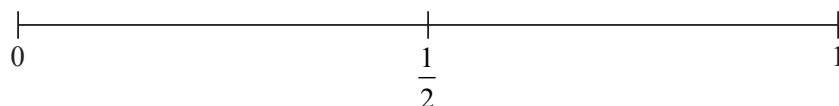
(Total for Question 23 is 2 marks)



6 Shari has a fair ordinary dice.

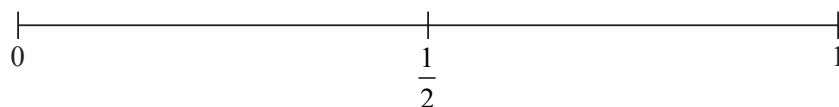
She rolls the dice once.

- (a) On the probability scale, mark with a cross (×) the probability that Shari gets the number 7



(1)

- (b) On the probability scale, mark with a cross (×) the probability that Shari gets an even number.



(1)

(Total for Question 6 is 2 marks)

11 Rima is going to roll a fair 6-sided dice.

- (a) Choose the word that best describes the probability that the dice will land on the number 3

impossible

unlikely

evens

likely

certain

.....
(1)

- (b) Choose the word that best describes the probability that the dice will land on an odd number.

impossible

unlikely

evens

likely

certain

.....
(1)

(Total for Question 11 is 2 marks)

12 A car travels at an average speed of 37 miles per hour for 3 hours.

Work out the distance that the car travels in the 3 hours.

..... miles

(Total for Question 12 is 2 marks)



20 (a) Write 468 000 in standard form.

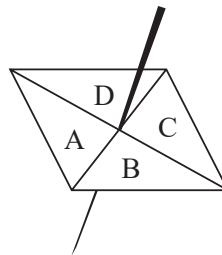
.....
(1)

(b) Write 5.037×10^{-4} as an ordinary number.

.....
(1)

(Total for Question 20 is 2 marks)

21 Here is a biased spinner.



The table shows the probabilities that when the spinner is spun it will land on A, on B, on C and on D.

Letter	A	B	C	D
Probability	0.4	0.21	0.32	0.07

Luka will spin the spinner 200 times.

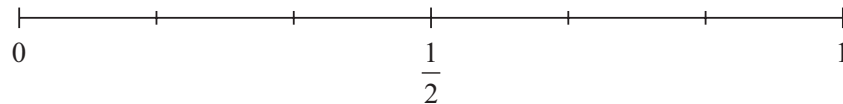
Work out an estimate for the number of times the spinner will land on A.

.....
(Total for Question 21 is 2 marks)

7 Tom has a fair ordinary dice.

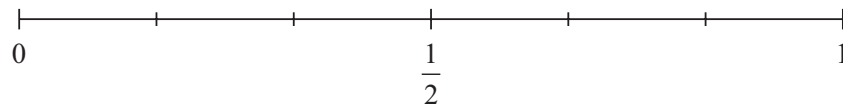
He rolls the dice once.

- (a) On the probability scale below, mark with a cross (×) the probability that Tom gets the number 2



(1)

- (b) On the probability scale below, mark with a cross (×) the probability that Tom gets a number greater than 4



(1)

(Total for Question 7 is 2 marks)

8 Here is a menu.

Drink	Cake
Coffee (C)	Brownie (B)
Tea (T)	Flapjack (F)
Lemonade (L)	Scone (S)

Asma can choose one drink and one cake.

Write down all the possible combinations Asma can choose.

.....

.....

.....

(Total for Question 8 is 2 marks)

17 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 17 is 3 marks)



19 There are only blue cubes, yellow cubes and green cubes in a bag.

There are

twice as many blue cubes as yellow cubes
and four times as many green cubes as blue cubes.

Hannah takes at random a cube from the bag.

Work out the probability that Hannah takes a yellow cube.

(Total for Question 19 is 3 marks)



26 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 26 is 3 marks)



15 Bert has 100 cards.

There is a whole number from 1 to 100 on each card.

No cards have the same number.

Bert puts a star on every card that has a multiple of 3 on it.

He puts a circle on every card that has a multiple of 5 on it.

Work out how many cards have both a star and a circle on them.

.....
(Total for Question 15 is 3 marks)

16 Write down the ratio of 450 grams to 15 grams.

Give your answer in its simplest form.

.....
(Total for Question 16 is 2 marks)



16 There are only 5 blue cards, 2 green cards and 4 red cards in a pack.

Isabella is going to take at random one card from the pack.

(a) Write down the probability that Isabella will take a blue card.

.....
(2)

Ken is going to throw a biased dice once.

The probability that the dice will land on six is 0.3

(b) What is the probability that the dice will **not** land on six?

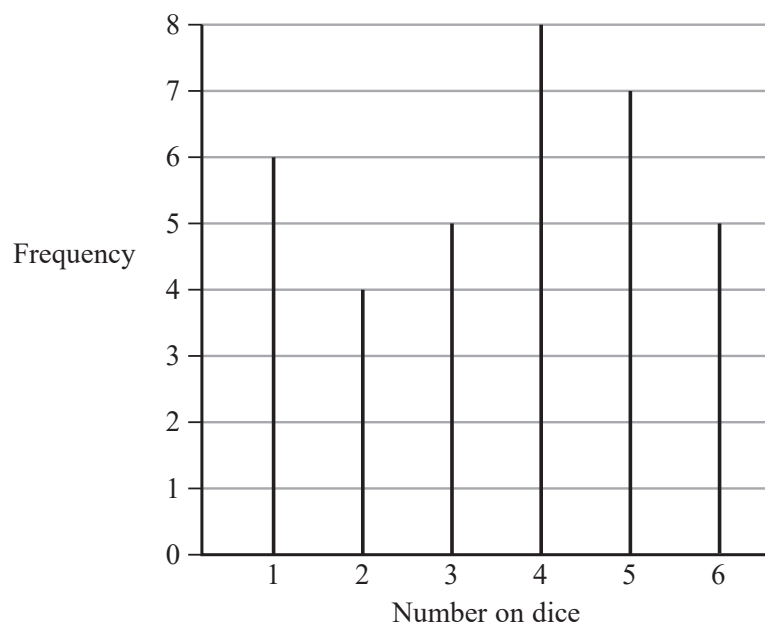
.....
(1)

(Total for Question 16 is 3 marks)



- 8 5 students throw a dice.
They each throw the dice the same number of times.

The diagram gives information about the number of times the dice lands on each number.



Work out how many times each student throws the dice.

(Total for Question 8 is 3 marks)

7 Here is a list of 8 letters.

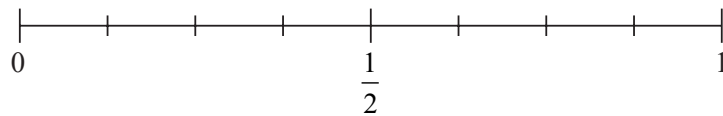
B C A A A A B A

(a) Write down the mode.

.....
(1)

One of the 8 letters is going to be picked at random.

(b) (i) On the probability scale, mark with a cross (×) the probability that this letter will be B.



(1)

(ii) Find the probability that this letter will be C.

.....
(1)

(Total for Question 7 is 3 marks)

8 (a) Solve $m - 3 = 4$

$m =$
(1)

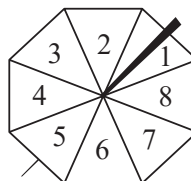
(b) Solve $3n + n = 24$

$n =$
(2)

(Total for Question 8 is 3 marks)



15 Here is a fair ordinary dice and a fair 8-sided spinner.



Charlie throws the dice once and spins the spinner once.

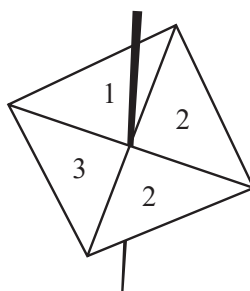
Is Charlie more likely to get

a number less than 3 on the dice
or a number greater than 5 on the spinner?

You must show all your working.

(Total for Question 15 is 3 marks)

7 Here is a 4-sided spinner.



Samina spins the spinner once.

(a) Choose the word that best describes the probability that the spinner lands on 2

impossible	unlikely	evens	likely	certain
------------	----------	-------	--------	---------

.....
(1)

(b) Choose the word that best describes the probability that the spinner lands on a number less than 4

impossible	unlikely	evens	likely	certain
------------	----------	-------	--------	---------

.....
(1)

Ralph rolls a biased dice once.

The probability that he gets the number 5 is 0.4

(c) Work out the probability that Ralph does **not** get the number 5

.....
(1)

(Total for Question 7 is 3 marks)



9 Selina has a bag of 22 counters.

5 of the counters are blue.

9 of the counters are red.

8 of the counters are pink.

Selina takes at random a counter from the bag.

Write down the probability that Selina

(i) takes a red counter,

.....
(1)

(ii) does **not** take a pink counter,

.....
(1)

(iii) takes a white counter.

.....
(1)

(Total for Question 9 is 3 marks)



13 There are only £10 notes and £20 notes in a wallet.

Ali takes at random a note from the wallet.

(a) Write down the probability that Ali takes a note with a value of more than £5

.....
(1)

There are only 1p coins and 2p coins in a bag.

The total value of the coins in the bag is 40p

The total value of the 1p coins is the same as the total value of the 2p coins.

Simon takes at random a coin from the bag.

(b) Find the probability that Simon takes a 1p coin.

.....
(2)

(Total for Question 13 is 3 marks)



14 Victoria throws an ordinary fair 6-sided dice once.

She says,

“The probability of getting a 3 is half the probability of getting a 6”

(a) Is Victoria correct?

You must explain your answer.

(1)

Andy throws the dice twice.

He says,

“The probability of getting a 6 on both throws is $\frac{2}{6}$ ”

(b) Is Andy correct?

You must explain your answer.

(1)

Indre throws the dice once.

She also throws a coin to get Heads or Tails.

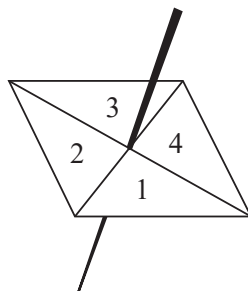
(c) List all the possible outcomes she can get.

(2)

(Total for Question 14 is 4 marks)



14 Here is a 4-sided spinner.



The table shows the probabilities that when the spinner is spun it will land on 1, on 3 and on 4

Number	1	2	3	4
Probability	0.2		0.4	0.1

The spinner is spun once.

(a) Work out the probability that the spinner will land on 2

.....
(1)

(b) Which number is the spinner least likely to land on?

.....
(1)

Jake is going to spin the spinner 60 times.

(c) Work out an estimate for the number of times the spinner will land on 1

.....
(2)

(Total for Question 14 is 4 marks)

22 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 22 is 4 marks)



16 In a bag there are only red counters, blue counters, green counters and yellow counters. A counter is taken at random from the bag.

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

Colour	red	blue	green	yellow
Probability	0.4			0.25

the number of blue counters : the number of green counters = 3 : 4

Complete the table.

(Total for Question 16 is 4 marks)

- 26 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 26 is 4 marks)

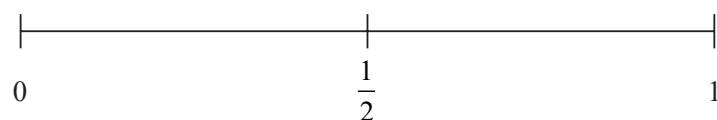


10 Here is a list of 8 numbers.

2 2 3 5 6 6 8 9

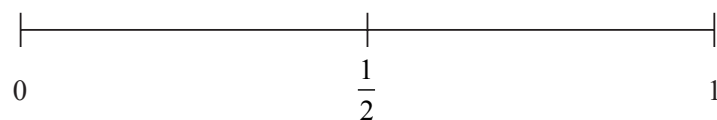
Kim picks at random one of these numbers.

- (a) On the probability scale below, mark with a cross (×) the probability that Kim picks a number 7



(1)

- (b) On the probability scale below, mark with a cross (×) the probability that Kim picks a number greater than 5



(1)

- (c) Find the probability that Kim picks an even number.

.....
(2)

(Total for Question 10 is 4 marks)

- 23** There are only red discs, blue discs and yellow discs in a bag.
There are 24 yellow discs in the bag.

Mel is going to take at random a disc from the bag.

The probability that the disc will be yellow is 0.16

the number of red discs : the number of blue discs = 5 : 4

Work out the number of red discs in the bag.

.....
(Total for Question 23 is 4 marks)



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

Number on dice	1	2	3	4	5	6
Probability			0.10	0.30	0.05	0.25

Karim assumes that the probabilities that the dice will land on 1 and on 2 are the same.

Karim rolls the biased dice 500 times.

- (a) Assuming Karim is right, work out an estimate for the number of times the dice will land on 2

(3)

Karim is wrong.
The probability that the dice will land on 2 is greater than the probability that the dice will land on 1

- (b) How does this information affect your answer to part (a)?

(1)

(Total for Question 19 is 4 marks)



15 There are 20 buttons in a box.

There are

6 blue buttons

9 green buttons

5 red buttons.

Jai puts 12 more buttons in the box.

These buttons are either blue buttons or red buttons.

Jai is going to pick at random one button from the box.

The probability that this button will be blue is $\frac{1}{4}$

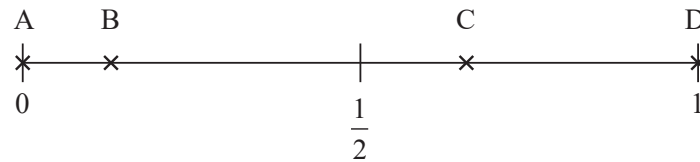
How many more red buttons did Jai put in the box?

You must show all your working.

(Total for Question 15 is 4 marks)



- 7 Here is a probability scale.
It shows the probability of each of the events A, B, C and D.



- (a) Write down the letter of the event that is certain.

.....
(1)

- (b) Write down the letter of the event that is unlikely.

.....
(1)

There are 12 counters in a bag.

3 of the counters are red.

1 of the counters is blue.

2 of the counters are yellow.

The rest of the counters are green.

Caitlin takes at random a counter from the bag.

- (c) Show that the probability that this counter is yellow or green is $\frac{2}{3}$

.....
(3)

(Total for Question 7 is 5 marks)

24 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 24 is 5 marks)

16 Four biased coins, A, B, C and D are thrown.

The probability that each coin will land on Heads is shown in the table.

Coin	Probability
A	0.33
B	0.033
C	$\frac{1}{3}$
D	30%

(a) (i) Which coin is least likely to land on Heads?

.....
(1)

(ii) Which coin is most likely to land on Heads?

.....
(1)

Julie says,

“The probability that coin C will land on Heads is the same as the probability that coin C will land on Tails.”

(b) Is she correct?

Give a reason for your answer.

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

Coin B is going to be thrown 4000 times.

(c) Work out an estimate for the number of times coin B will land on Heads.

.....
(2)

(Total for Question 16 is 5 marks)



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

The table shows the number of blue counters in the bag.

Colour	blue	green	red	yellow
Number of counters	30			

There is a total of 100 counters in the bag.

Ashin takes at random a counter from the bag.

(a) Find the probability that the counter is **not** blue.

.....
(2)

The ratio of the number of blue counters to the number of green counters is 2 : 3

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

.....
(2)

Bradley says,

“The number of red counters in the bag is the same as the number of yellow counters in the bag.”

(c) Can Bradley be correct?

Give a reason for your answer.

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

(Total for Question 17 is 5 marks)



20 There are only red counters, white counters, blue counters and green counters in a bag.

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

The table shows the probability that he will take a red counter and the probability that he will take a white counter.

Colour	red	white	blue	green
Probability	0.3	0.1		

There are twice as many blue counters as there are green counters in the bag.

(a) Work out the probability that Chris will take a blue counter.

.....
(3)

There are 45 red counters in the bag.

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

.....
(2)

(Total for Question 20 is 5 marks)



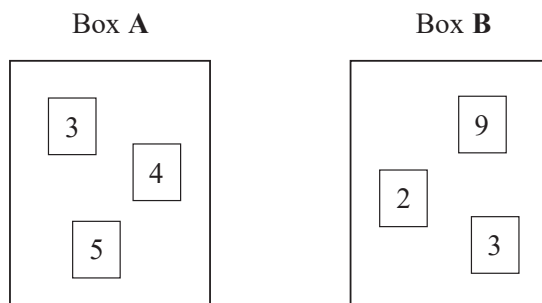
SUB-TOPIC P1b

SAMPLE SPACES, TWO-WAY TABLES & LISTING

Sub-topic P1b · 20 questions · 77 marks · lowest tariff first



- 17 There are 3 cards in Box A and 3 cards in Box B.
There is a number on each card.

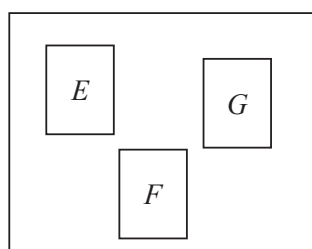


Ryan takes at random a card from Box A and a card from Box B.
He adds together the numbers on the two cards to get a total score.

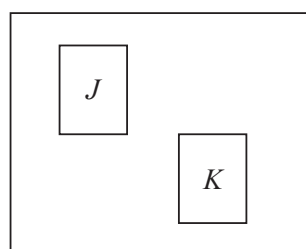
Work out the probability that the total score is an odd number.

(Total for Question 17 is 2 marks)

- 7 There are three cards in bag A and two cards in bag B.
There is a letter on each card.



Bag A



Bag B

James takes a card from bag A and then a card from bag B.

List all the possible outcomes.

.....

.....

.....

(Total for Question 7 is 2 marks)

- 8 On Monday, Sandy pays for 2 plane tickets, 7 nights in a hotel and 2 theme park tickets.

	dollars
each plane ticket	600
each night in a hotel	120
each theme park ticket	250

Show that Sandy pays more than 2500 dollars on Monday.

(Total for Question 8 is 3 marks)

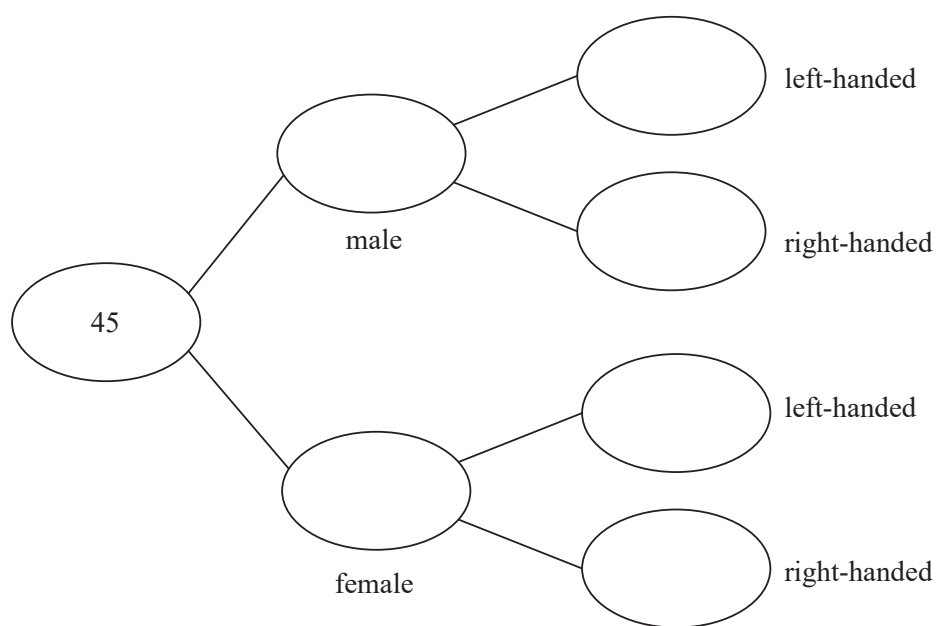


14 Each worker in a factory is either left-handed or right-handed.

22 of the 45 workers are male.

16 of the 34 right-handed workers are female.

Complete the frequency tree for this information.



(Total for Question 14 is 3 marks)

- 14** Ishmael asked 30 students at college to tell him the sport they each like the best from cricket or tennis or swimming.

11 of the 20 female students said swimming.

2 of the male students said tennis.

5 students said cricket.

The number of male students who said cricket was the same as the number of male students who said swimming.

Complete the two-way table.

	Cricket	Tennis	Swimming	Total
Male students				
Female students				20
Total				30

(Total for Question 14 is 3 marks)

- 15** Jamil makes a drink by mixing
1 part of orange squash with 9 parts of water.

He uses 750 millilitres of orange squash.

Jamil is going to put the drink he has mixed into 1 litre bottles.

Work out the greatest number of 1 litre bottles that Jamil can completely fill.

(Total for Question 15 is 3 marks)



- 9 Vadim has 56 clocks.
The clocks are only red, only blue or only black.

32 of the clocks are plastic.

5 of the 14 blue clocks are plastic.

8 of the 12 red clocks are **not** plastic.

Use this information to complete the two-way table.

	Red	Blue	Black	Total
Plastic				
Not plastic				
Total				

(Total for Question 9 is 3 marks)

- 10 Corina has £300 to spend on books.
Each book costs £4.85

Work out the greatest number of books Corina can buy.

(Total for Question 10 is 3 marks)



13 Sophie works in a bed shop.
During the last three months she sold 198 beds.

59 beds were sold without a mattress.
45 beds were double beds.
17 of the single beds were sold without a mattress.
67 of the 83 king size beds were sold with a mattress.

Use this information to complete the two-way table.

	Single	Double	King size	Total
With mattress				
Without mattress				
Total				

(Total for Question 13 is 3 marks)

14 The box below contains three mathematical symbols.

= < >

From the box, choose a symbol to make each of the following statements correct.

- (i) $\frac{5}{8}$ $\frac{2}{8}$

(1)
- (ii) -2×-3 $-3 + 9$

(1)

(Total for Question 14 is 2 marks)

- 23** 200 students chose one language to study.
Each student chose one language from French or Spanish or German.

Of the 200 students,

90 are boys and the rest of the students are girls

70 chose Spanish

60 of the 104 students who chose French are boys

18 girls chose German.

Work out how many boys chose Spanish.

(Total for Question 23 is 3 marks)



12 A factory makes mountain bikes and road bikes.
Each bike has disc brakes or rim brakes or caliper brakes.

In June the factory makes a total of 240 bikes.

102 of the bikes are mountain bikes.
75 of the 110 bikes with disc brakes are mountain bikes.
105 bikes have rim brakes.
20 of the mountain bikes have caliper brakes.

Use this information to complete the two-way table.

	disc brakes	rim brakes	caliper brakes	Total
mountain bikes				
road bikes				
Total				

(Total for Question 12 is 3 marks)

13 (a) Simplify $n \times n \times n$

.....
(1)

(b) Solve $5k - 4 = 26$

$k =$
(2)

(Total for Question 13 is 3 marks)

11 There are 30 children in a nursery school.

At least 1 adult is needed for every 8 children in the nursery.

(a) Work out the least number of adults needed in the nursery.

.....
(2)

2 more children join the nursery.

(b) Does this mean that more adults are needed in the nursery?

You must give a reason for your answer.

.....
(1)

(Total for Question 11 is 3 marks)

12 Emma has 45 rabbits.

30 of the rabbits are male.

8 of the female rabbits have short hair.

12 of the rabbits with long hair are male.

(a) Use the information to complete the two-way table.

	Male	Female	Total
Long hair			
Short hair			
Total			

(3)

One of Emma's rabbits is chosen at random.

(b) Write down the probability that this rabbit is a female with short hair.

.....
(1)

(Total for Question 12 is 4 marks)

21 There are 40 students in a class.

Each student walks to school or cycles to school or gets the bus to school.

There are 22 girls in the class.

9 of the girls walk to school.

7 of the boys cycle to school.

6 of the 10 students who get the bus to school are boys.

Find the number of these students who walk to school.

.....
(Total for Question 21 is 4 marks)

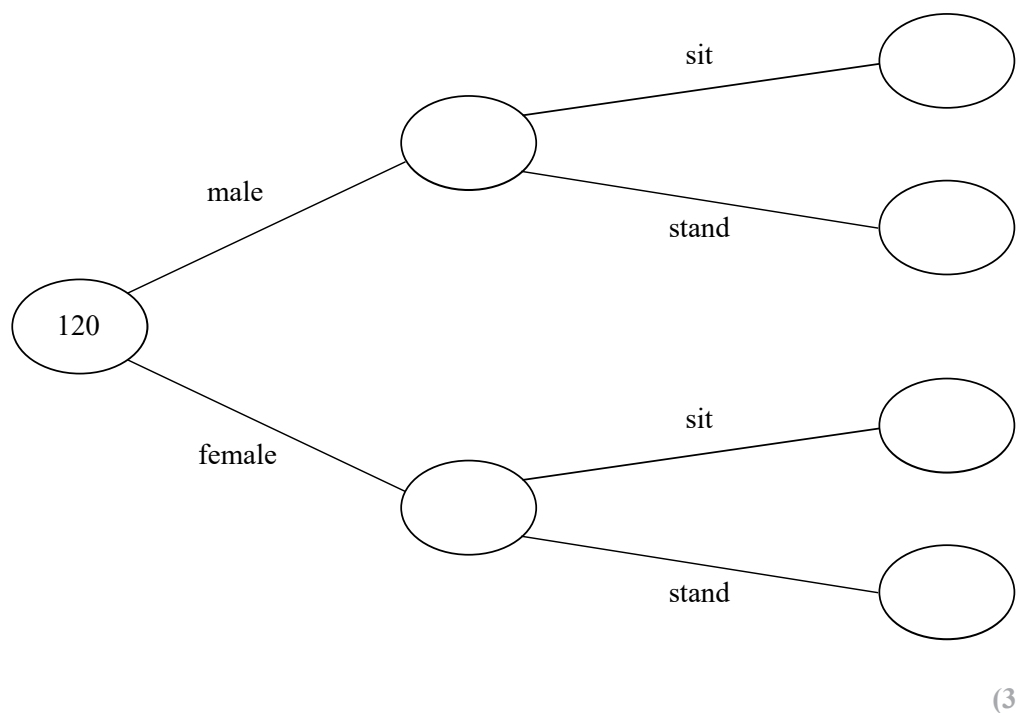


15 120 people were at a hockey match.

Each person was asked if they wanted to stand or to sit to watch the match.

75 of the people were female
29 of the males wanted to stand
30 of the people wanted to sit

(a) Use this information to complete the frequency tree.



One of the 120 people is chosen at random.

(b) Write down the probability that this person is a male who wanted to stand.

.....
(1)

(Total for Question 15 is 4 marks)

16 160 people were asked to choose their favourite type of book.
They each chose from romance or adventure or horror or thriller.

85 of these people were children.
The rest were adults.

19 of the 33 people who chose romance were children.
34 of the 76 people who chose adventure were adults.
7 adults chose thriller.

The number of children who chose thriller was the same as the number of adults who chose horror.

Work out the total number of people who chose horror.
You must show how you get your answer.

(Total for Question 16 is 4 marks)



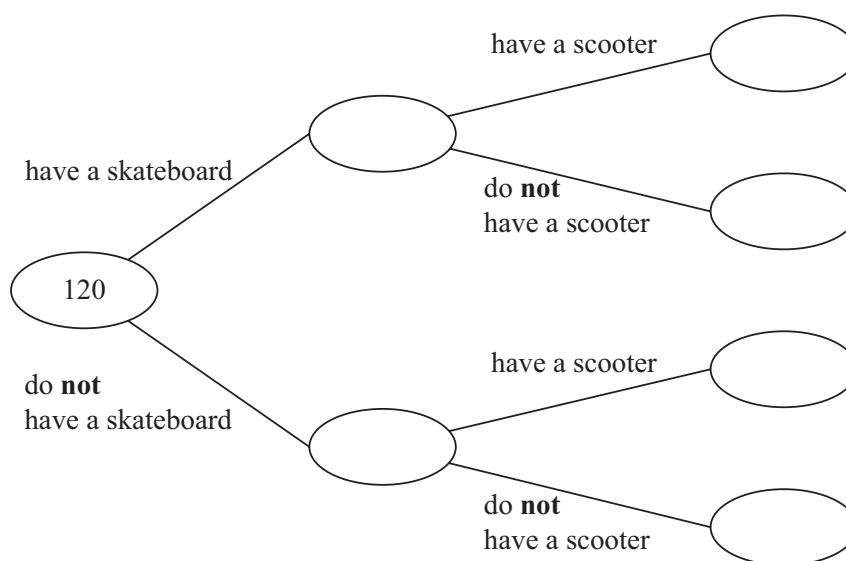
17 120 students are asked if they have a skateboard or a scooter.

37 of the students have a skateboard.

21 of the students who have a skateboard also have a scooter.

65 of the students have a scooter.

(a) Use this information to complete the frequency tree.



(3)

One of the 120 students is chosen at random.

(b) Find the probability that this student does **not** have a skateboard.

(1)

(Total for Question 17 is 4 marks)



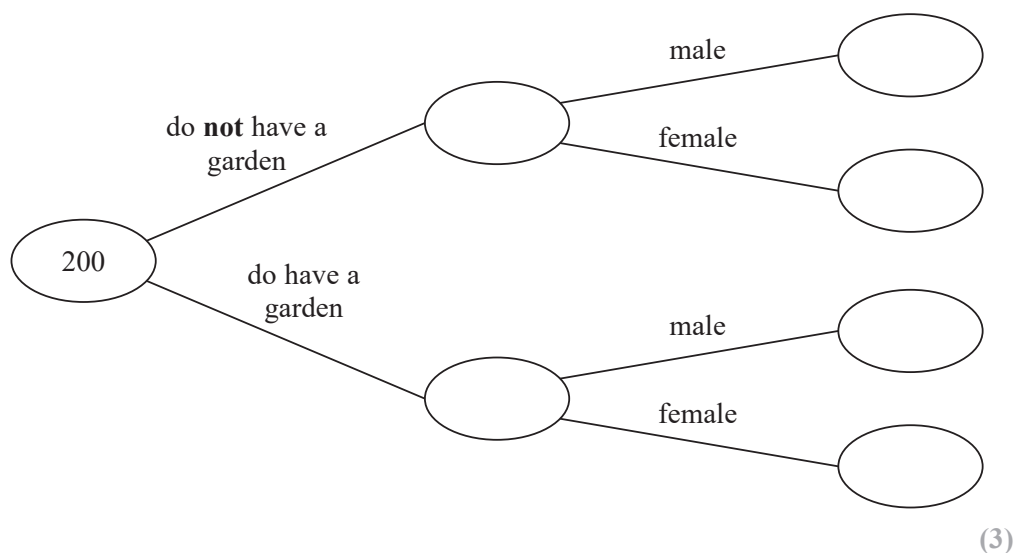
12 200 people live in a village.

23 people do **not** have a garden.

10 males do **not** have a garden.

95 people are male.

(a) Use this information to complete the frequency tree.



One of the people who does **not** have a garden is chosen at random.

(b) Write down the probability that this person is female.

(2)

(Total for Question 12 is 5 marks)



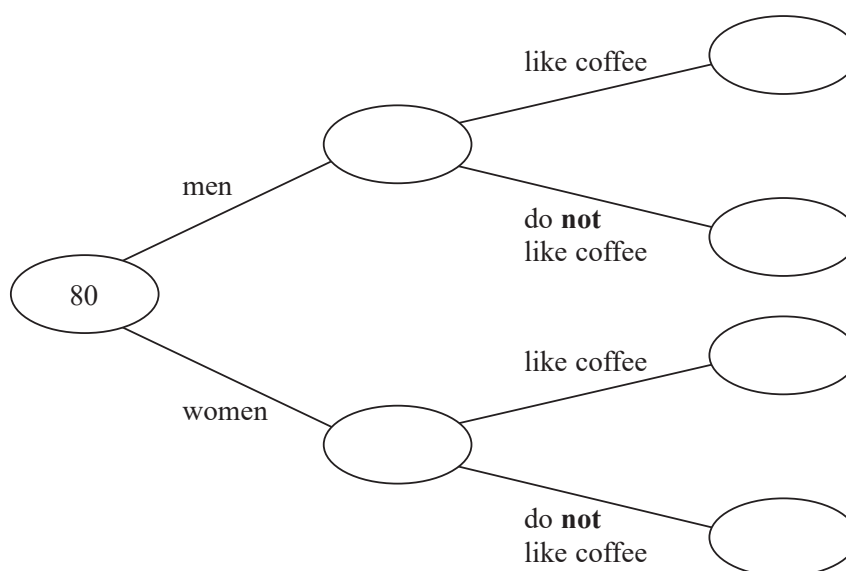
17 80 people are asked if they like coffee.

48 of these people are women.

61 of the 80 people like coffee.

8 of the men do **not** like coffee.

(a) Use this information to complete the frequency tree.



(3)

One of the people who like coffee is chosen at random.

(b) Find the probability that this person is a woman.

(2)

(Total for Question 17 is 5 marks)



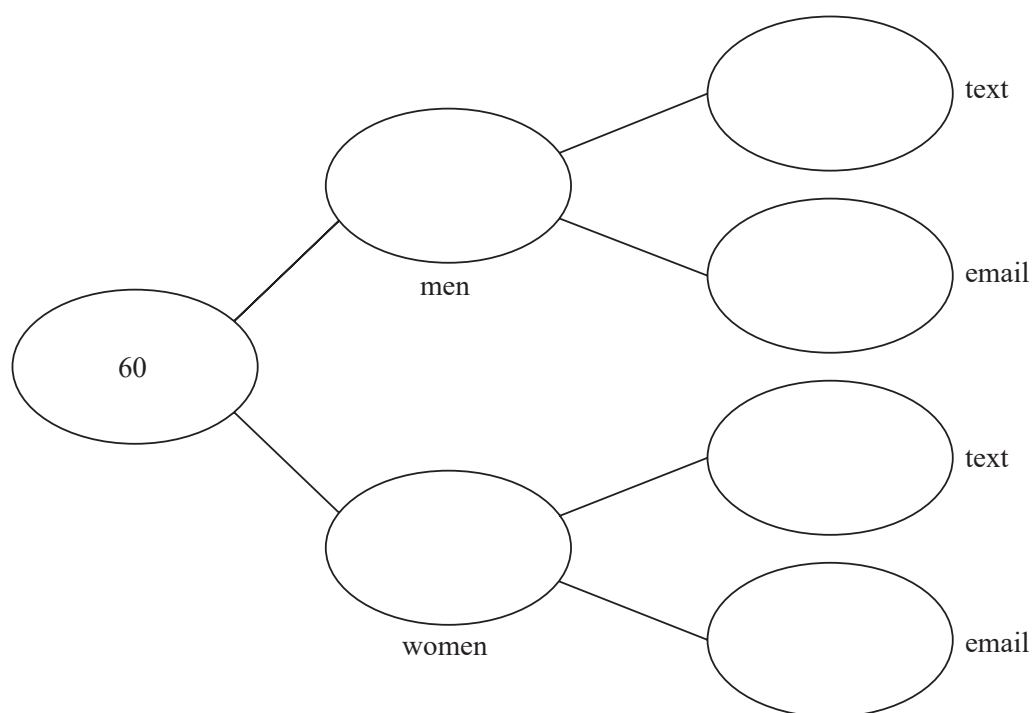
17 60 people are asked if they prefer to text or to email their friends.

38 of the people are women and the rest are men.

15 of the men prefer to email their friends.

60% of the people prefer to text their friends.

Complete the frequency tree for this information.



(Total for Question 17 is 5 marks)

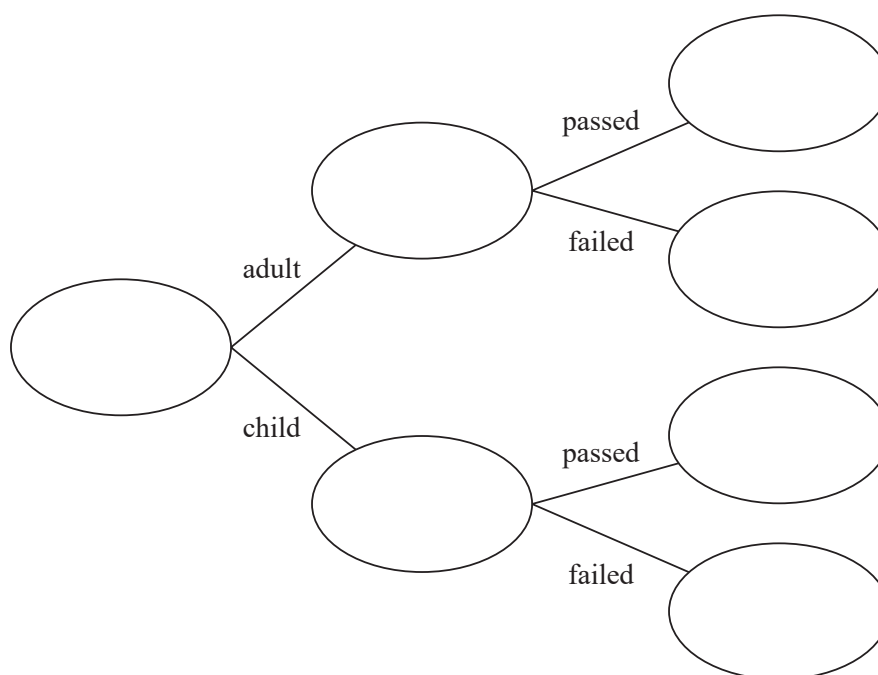


17 72 people did a test.

20 of the 32 adults who did the test passed.

6 of the children who did the test failed.

(a) Use this information to complete the frequency tree.



(3)

One of these people is picked at random.

(b) Find the probability that this person is an adult who failed the test.

(2)

(Total for Question 17 is 5 marks)



19 240 people work at a factory.

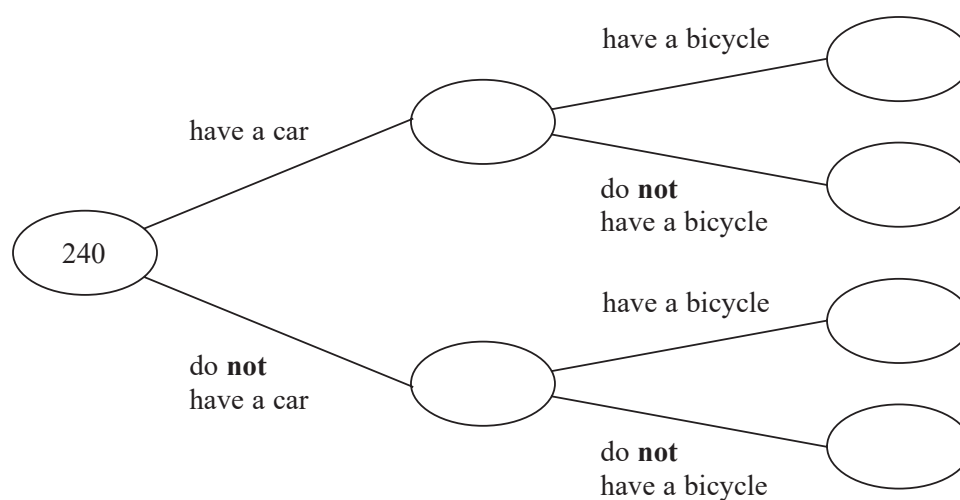
Of these people

150 have a car

110 have a bicycle

65 of the people who have a bicycle do **not** have a car.

(a) Use this information to complete the frequency tree.



(3)

(b) What percentage of the 150 people who have a car also have a bicycle?

..... %

(2)

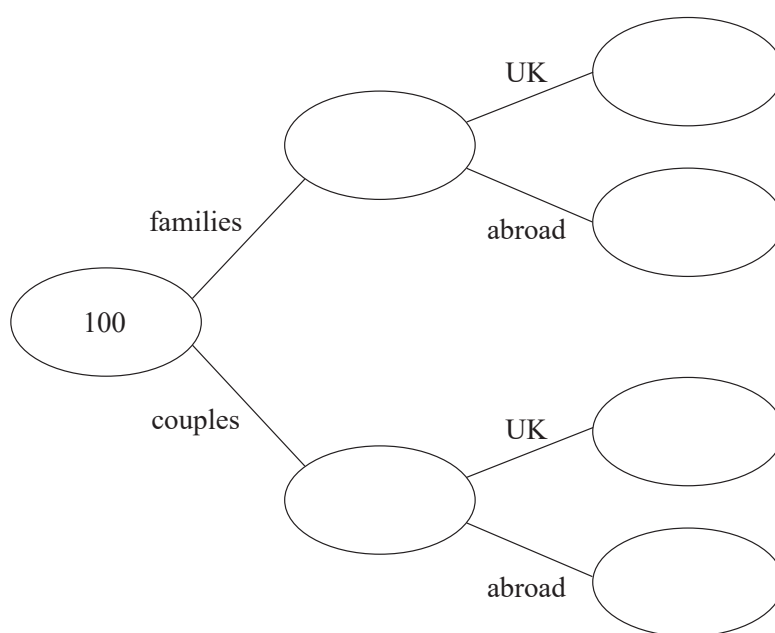
(Total for Question 19 is 5 marks)

- 15 A travel agent sold 100 holidays in April.
Each of these holidays was in the UK or was abroad.

64 of the 100 holidays were sold to families.
The rest of the holidays were sold to couples.

11 of the 18 holidays abroad were sold to couples.

- (a) Use this information to complete the frequency tree.



(3)

One of the holidays sold to a family is chosen at random.

- (b) Find the probability that this holiday was **not** abroad.

(2)

(Total for Question 15 is 5 marks)



11 500 people were asked what type of film they liked best.

280 of the 500 people were adults.
100 of the adults said they liked action films best.
80 of the children said they liked thriller films best.

150 of the people said they liked action films best.
200 of the people said they liked comedy films best.

(a) Complete the two-way table.

	Comedy	Thriller	Action	Total
Adults				
Children				
Total				500

(3)

One of these 500 people is chosen at random.

(b) Find the probability that this person is an adult who said they liked action films best.

(2)

(Total for Question 11 is 5 marks)



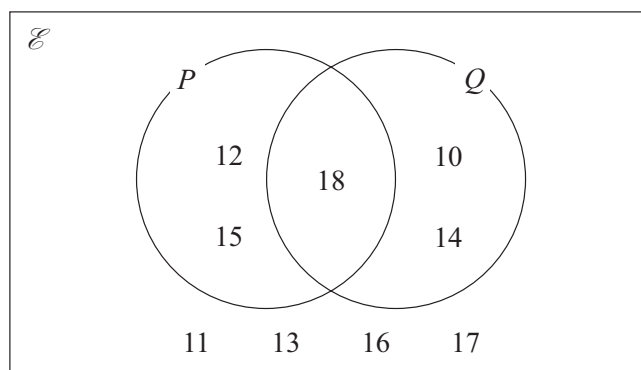
SUB-TOPIC P1c

VENN DIAGRAMS & SET NOTATION

Sub-topic P1c · 7 questions · 34 marks · lowest tariff first



23 Here is a Venn diagram.



(a) Write down the numbers that are in set P'

(1)

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

(b) Find the probability that this number is in the set $P \cup Q$

(2)

(Total for Question 23 is 3 marks)



19 Solve $4(x - 6) = 44$

$$x = \dots\dots\dots$$

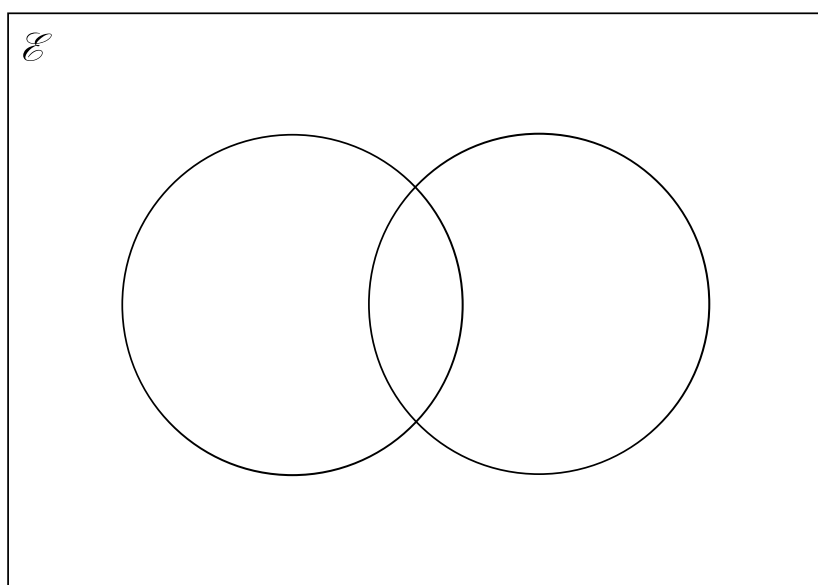
(Total for Question 19 is 2 marks)

20 $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13\}$

$$A = \{\text{multiples of 3}\}$$

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

Complete the Venn diagram for this information.

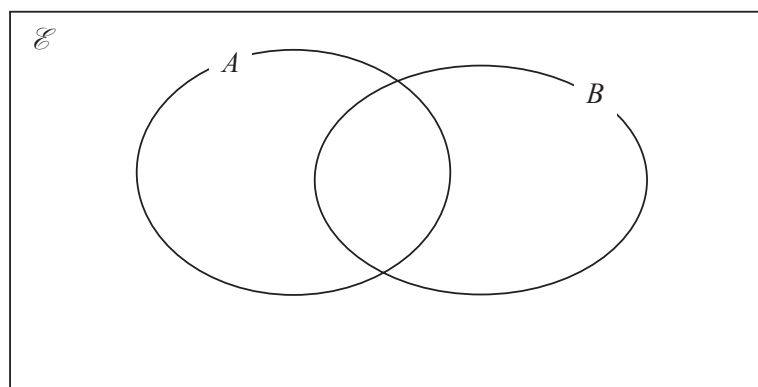


(Total for Question 20 is 4 marks)

24 $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$

$$A = \{1, 5, 6, 8, 9\}$$

$$B = \{2, 6, 9\}$$



(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 24 is 5 marks)

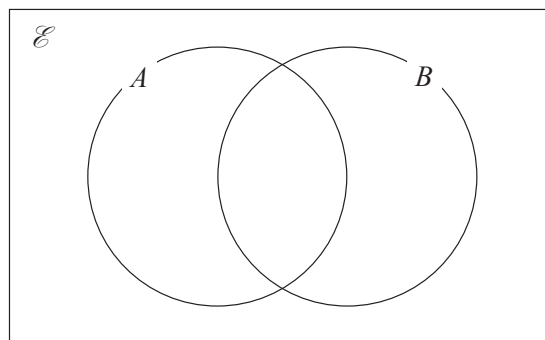


22 $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

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

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

(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 22 is 5 marks)

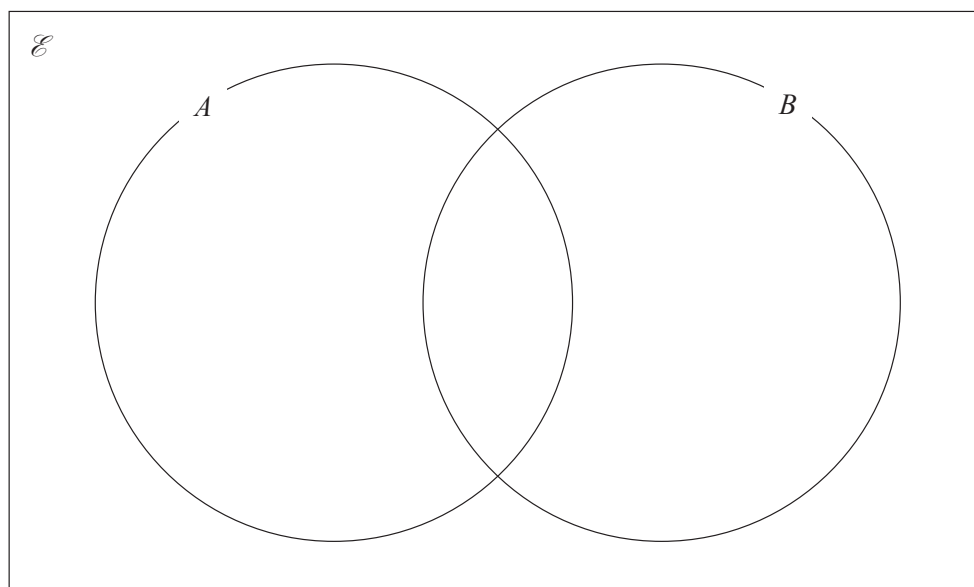


24 $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

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

$B = \{\text{square numbers}\}$

(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 B'

(2)

(Total for Question 24 is 5 marks)

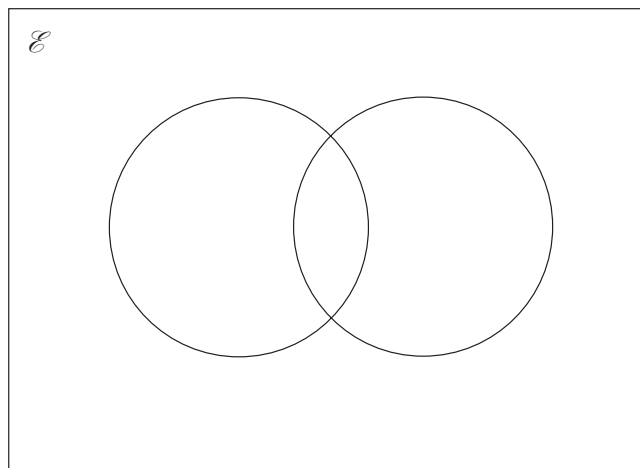


15 $\mathcal{E} = \{\text{odd numbers less than } 30\}$

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

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

(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 15 is 6 marks)

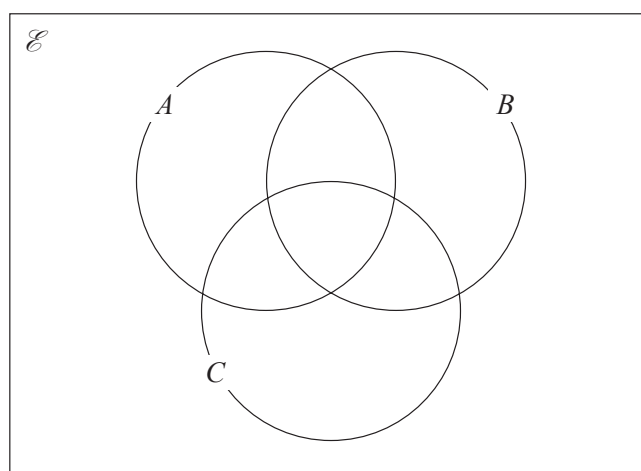
20 $\mathcal{E} = \{\text{even numbers between 1 and 25}\}$

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

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

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

(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)

SUB-TOPIC P1d

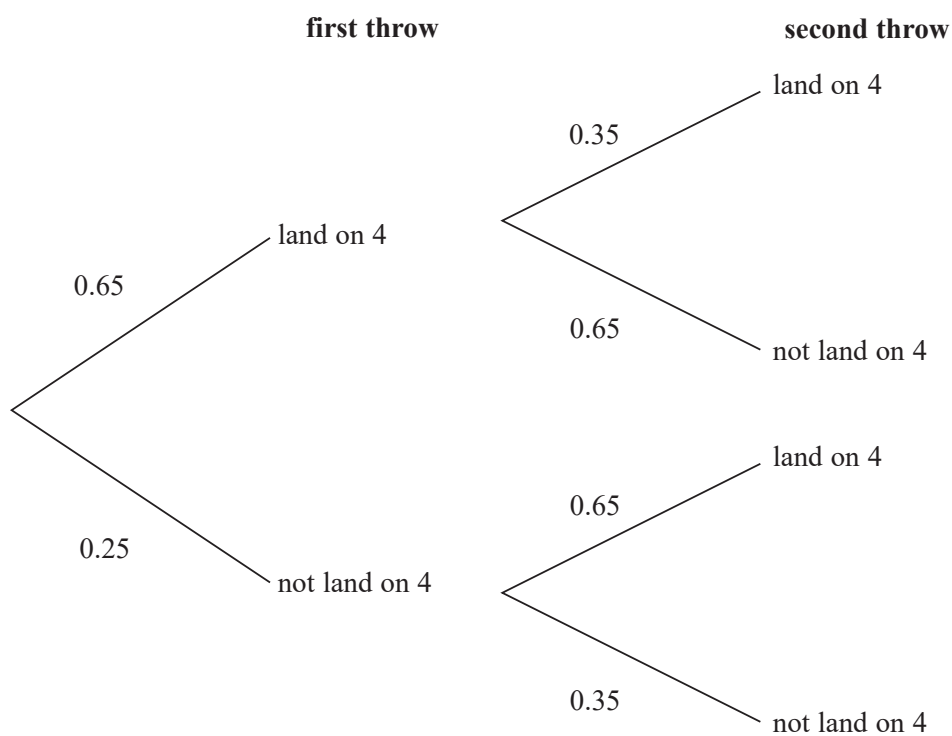
TREE DIAGRAMS, COMBINED & CONDITIONAL PROBABILITY

Sub-topic P1d · 9 questions · 31 marks · lowest tariff first



- 22** 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.



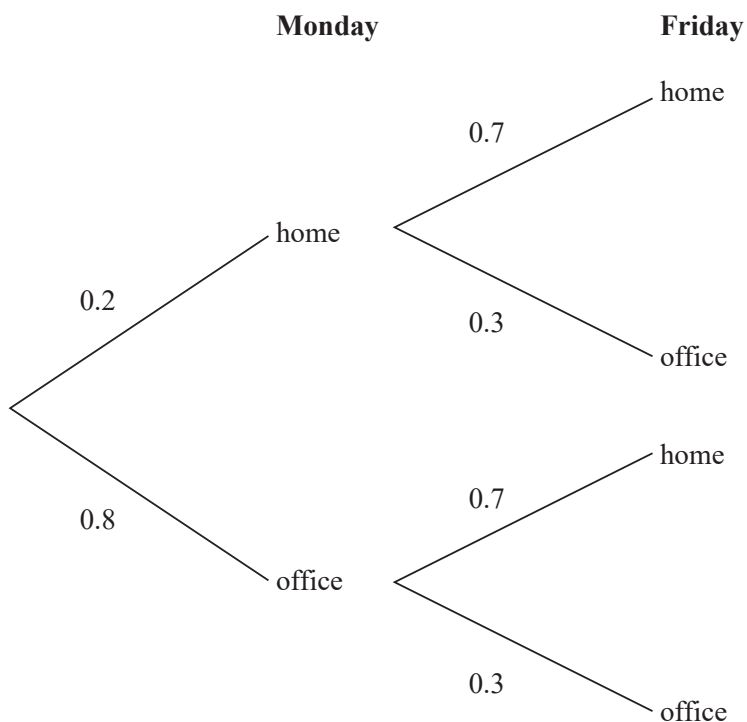
Write down **two** things that are wrong with the probability tree diagram.

2.....

(Total for Question 22 is 2 marks)



- 31** The probability tree diagram shows the probabilities that Shayla will work at home or will work at the office on two days next week.



Work out the probability that Shayla will work at home on Monday and work at the office on Friday.

(Total for Question 31 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS



- 15** A map has a scale of 1 : 25 000
On the map, a road has a length of 14 cm.

Work out the real length of the road.
Give your answer in kilometres.

..... kilometres

(Total for Question 15 is 3 marks)

- 16** Aisha has two boxes of sweets, box **A** and box **B**.

In box **A**, there are only 10 red sweets and 30 green sweets.
In box **B**, there are only 7 red sweets and 18 green sweets.

Aisha is going to take at random a sweet from box **A** and a sweet from box **B**.

Which box gives Aisha the greater probability of taking a red sweet, box **A** or box **B**?
You must show how you get your answer.

(Total for Question 16 is 3 marks)



27 Amina has two bags.

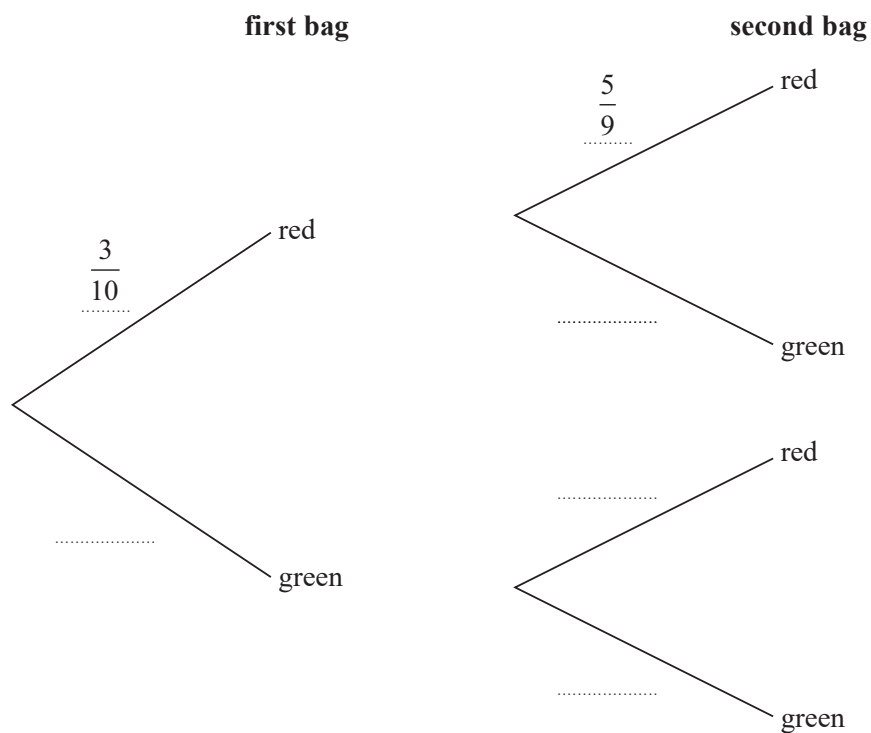
In the first bag there are 3 red balls and 7 green balls.

In the second bag there are 5 red balls and 4 green balls.

Amina takes at random a ball from the first bag.

She then takes at random a ball from the second bag.

(a) Complete the probability tree diagram.



(2)

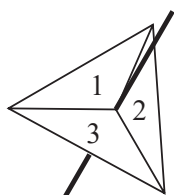
(b) Work out the probability that Amina takes two red balls.

(2)

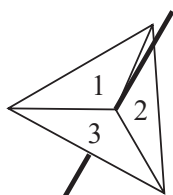
(Total for Question 27 is 4 marks)



27 Amanda has two fair 3-sided spinners.



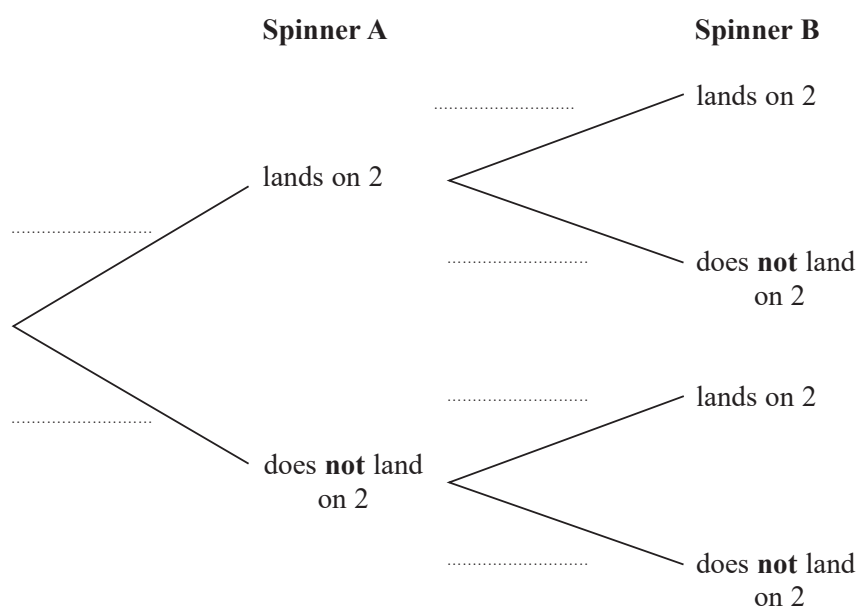
Spinner A



Spinner B

Amanda spins each spinner once.

(a) Complete the probability tree diagram.



(2)

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

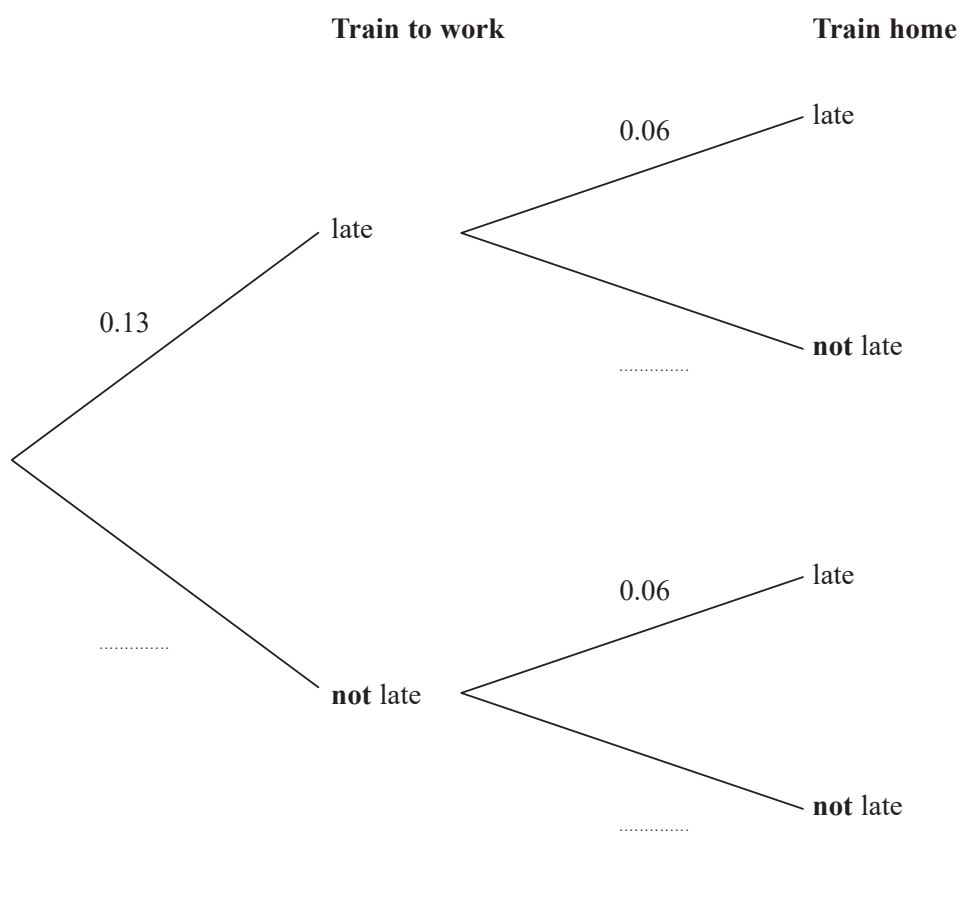
(2)

(Total for Question 27 is 4 marks)

- 20 Lorena gets a train at the same time each morning to go to work.
She gets a train at the same time each evening to come home.

The probability tree diagram shows the probabilities of each train arriving late.

- (a) Complete the probability tree diagram.



For a day that Lorena goes to work,

- (b) work out the probability that the train to work and the train home will both arrive late.

(2)

(Total for Question 20 is 4 marks)

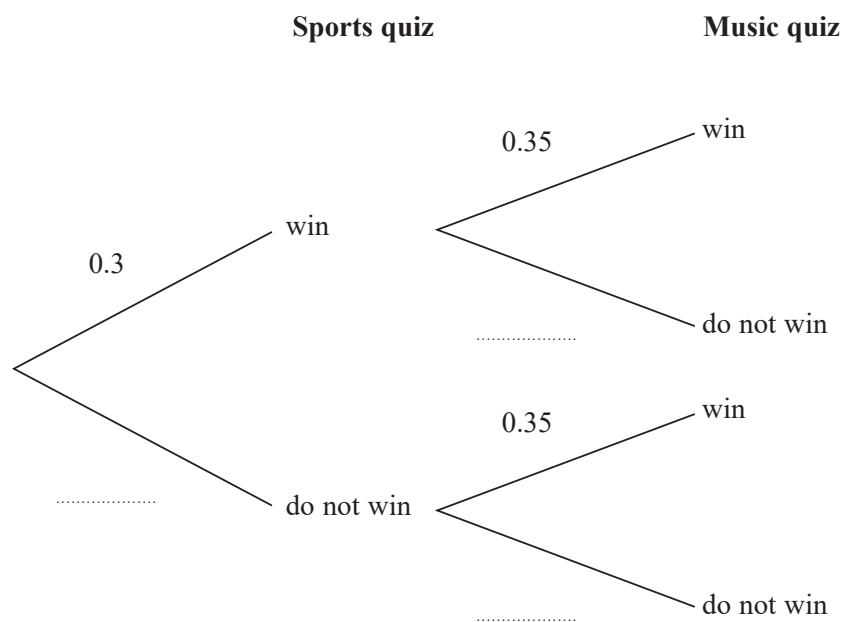


26 One weekend the Keddie family is going to do a sports quiz and a music quiz.

The probability that the family will win the sports quiz is 0.3

The probability that the family will win the music quiz is 0.35

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that the Keddie family will win both the sports quiz and the music quiz.

(2)

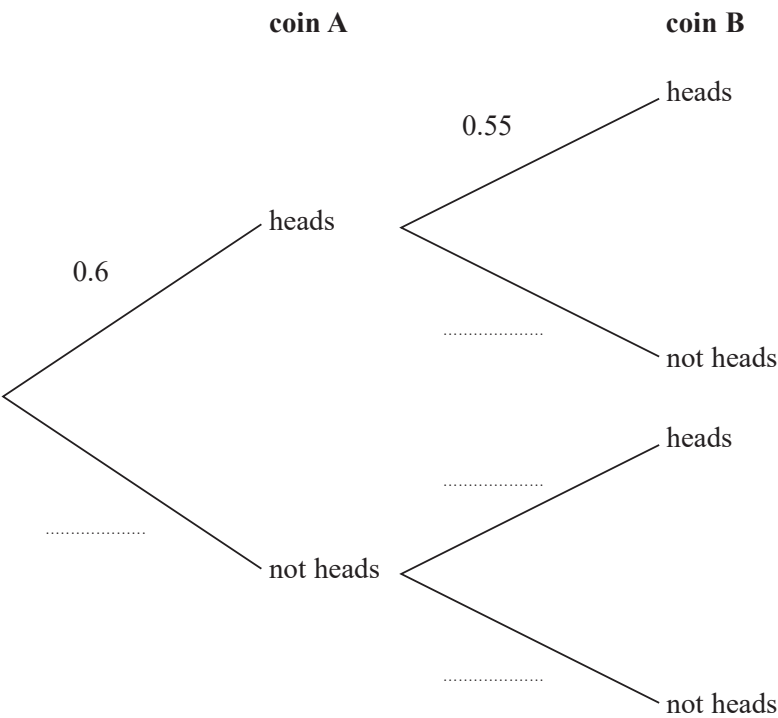
(Total for Question 26 is 4 marks)



27 Tim has two biased coins, coin **A** and coin **B**.
He is going to throw both coins.

The probability that coin **A** will land on heads is 0.6
The probability that coin **B** will land on heads is 0.55

(a) Complete the probability tree diagram.



(2)

Tim throws coin **A** once and he throws coin **B** once.

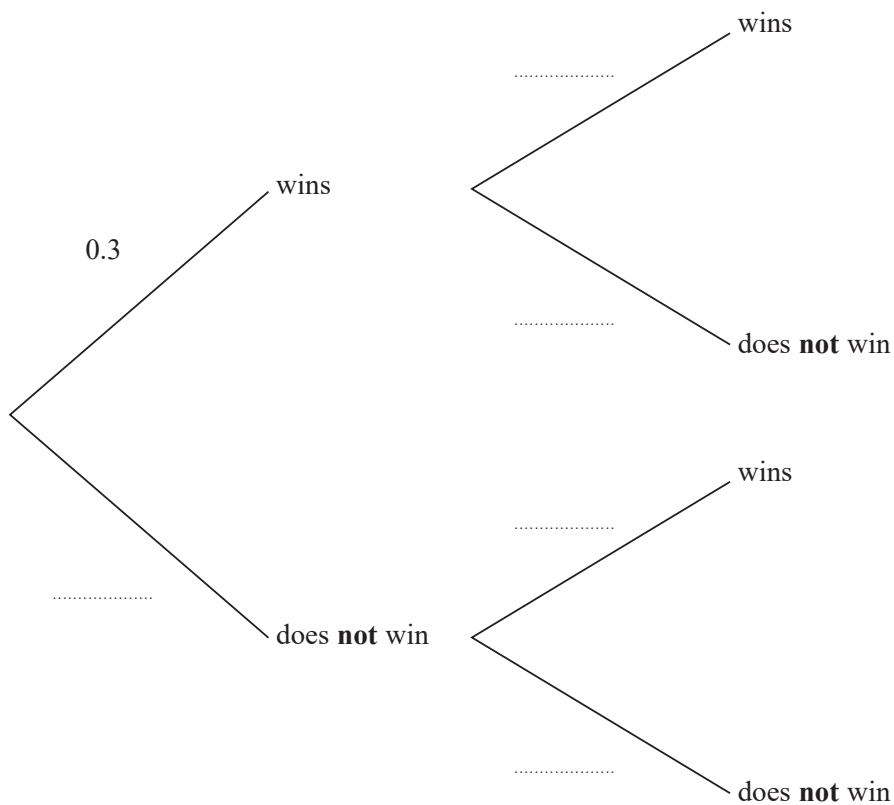
(b) Work out the probability that both coins land on heads.

(2)

(Total for Question 27 is 4 marks)

Dan plays two games of cards.

Game 2



(b) Work out the probability that Dan does **not** win either game.

(2)

(Total for Question 20 is 4 marks)

MARK SCHEMES

official mark schemes, in the same order as the questions



Paper 1MA1: 2F				
Question	Working	Answer	Mark	Notes
5 (a)		Monday wrong	C1	for seeing difference in tally marks and frequency for Monday
(b)		Comment	C1	for suitable comment, eg extra picture for Tuesday needed or explains that 0.5 of a CD is not possible
6		268.20	P1	for a process to work out the value of the £1 coins, eg. $495 \div 3 (= 165)$ or $495 \times 0.33...$ or of the 50p coins, eg. $124 \div 2 (= 62)$
			P1	for process to find the number of 20p coins, eg. $(495 - 124 - ("165")) (= 206)$
			P1	for complete process to find total value using consistent units., eg. $(("165") + (124 \div 2) + ("206" \times 0.2))$ or $165 + 62 + 41.2$
			A1	cao (accept 268.2)
7		0.985	B1	oe
8 (a)		25	B1	for 25 (accept 5^2)
(b)		24	B1	cao
(c)		23, 29	B1	for 23 and 29 and no extras
9		54	M1	for method to form equation, eg $90 + 2x + 3x = 360$ or for $360 - 90 (= 270)$
			M1	for $5x = 360 - 90$ or for $2x + 3x = 360 - 90$ or for $2x = 108$ or for $3x = 162$ or for $270 \div 5$
			A1	cao



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
11	No with reason	C1	No with reason Acceptable reasons: (The sections are) not the same size or the angles are not the same (The arrow is) more likely to land on 1 or 3 than on 2 (The probability for) 2 should be $\frac{1}{4}$ 2 has a 90° angle but 1 and 3 both have obtuse angles or 135° each 2 has a 90° angle but the others are bigger 2 has a smaller area (the sections have) different sizes/angles/areas (the spinner is) not split equally (the angle for) 2 would be 120 not 90 (The angle for) 2 would be 120 or all angles would be 120 (landing on) 2 is less than a third the chances for the other two are higher than (for) 2 Not acceptable: Yes with any reason given No it should be $\frac{2}{3}$ (No because) 2 has a 90° angle the bigger the angle the more likely	
12	280	P1 P1 A1	for process to find the number of bars of white chocolate or milk chocolate, eg $24 \div 3 \times 2$ oe (= 16) or $24 \div 3$ (= 8) or for process to work with total weight of chocolate, eg 24×35 (= 840) for complete process, eg $(24 - "16") \times 35$ or $"8" \times 35$ or $"840" \div 3$ cao	Allow use of 0.66.. or better or 0.33.. or better for both process marks Award P2 for an answer of 560



Paper: 1MA1/1F				
Question	Working	Answer	Mark	Notes
1		16	B1	cao
2		7.265	B1	cao
3 (a) (b)		56ef 12.5	B1 B1	cao oe
4		80	B1	cao
5		42	M1 A1	for showing method to work out 60% of 70, eg 0.6×70 or $(70 \div 10) \times 6 (= 42)$ cao
6 (i) (ii)		$\times$ at $\frac{1}{2}$ $\times$ at 0	B1 B1	
7		No (supported)	P1 P1 C1	process to work with either cost of 3 sausages e.g. $3 \times 2.30 (=6.9(0))$ or division of a cost by 3 process to work with costs of at least 3 of bread rolls, bread rolls, ketchup, change, sausages e.g. $2 \times 1.50 + 1.60$ or $1.50 + 1.60 + 0.30$, or $10 - 1.50 - 1.60 - 0.30$ or $10 - 1.50 - 1.50 - 1.60$ E.g. No and (£)5.10 and (£)6.90 No and (£)5.40 and (£)6.90 No and (£)1.70 No and (£)11.50 or (£)11.80 or shows cost of sausages at £2.30 and cost of any 2 other items is greater than (or equal to) £10 NB can work in £ or p throughout. Condone 5.1 etc

Paper: 1MA1/1F				
Question	Working	Answer	Mark	Notes
11 (a)		36	M1 A1	demonstrates the start of a method that could lead to the answer, eg recognition of square numbers, or use of differences, or diagrams cao
(b)		80	M1 A1	demonstrates the start of a method that could lead to the answer, eg repeated addition of 4, or 20×4 cao
(c)			C2 (C1)	conclusion with supportive evidence, eg $\text{odd} \times \text{odd} = \text{odd}$, or all odd numbers squared will be odd. (e.g. starts to work with (generate) square numbers for odd patterns or $(2n + 1)^2$ eg $1 \times 1 = 1$, or generates sequence for squares using differences)
12		$\frac{7}{17}$	M1 A1	for $\frac{a}{17}$ where $a \neq 7$ but < 17 or $\frac{7}{b}$ where $b \neq 17$ but > 7 oe
13 (a)		1.5 to 2	B1	in the range 1.5 to 2
(b)		7.5 to 12	M1 A1	for scale factor in the range 5 to 6 (ft) or for answer in the range 7.5 to 12



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
13	$\frac{338}{350}$	M1 A1	for $350 - 12 (=338)$ or $\frac{y}{350}$ oe where $y < 350$ and $y \neq 12$ or $1 - \frac{12}{350}$ oe oe	For the method mark probability fractions can be expressed as equivalent expressions, even if not correct probability notation eg. $338 : 350$ scores M1 A0 Using correct probability notation Allow 0.96 to 0.97 or 96% to 97%
14	4 22 45 18 7 23 16	C1 C1 C1	for correctly placing at least one piece of data (22 or 16) OR for finding at least one unknown piece of data (4, 18, 7 or 23) for correctly placing at least one piece of data (22 or 16) and for finding at least one unknown piece of data (4, 18, 7 or 23) for a complete correct tree. SC C2 if all 6 figures are shown as the numerator of fractions in the correct places	Unknown figures may be seen in working and need not be on the diagram Award of this mark implies the first C1
15	(a) Correct evaluation (b) Correct or corrected reasoning given	C1 C1	for explanation eg x is not a base angle or states $x = 54^\circ$ eg (because) alternate angles are equal, or Allied angles / Co-interior angles add up to 180 or they are not corresponding (they are alternate) OR selects correct reason used by William	



Paper: IMA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
12	$\frac{29}{49}$	P1	for $\frac{29}{a}$ where $a > 29$ or $\frac{b}{49}$ where $b < 49$ or $1 - \frac{20}{49}$ or $\frac{49-20}{c}$ where $c > 49 - 20$ OR for 29 and 49 with incorrect notation eg 29 : 49	
		A1	oe	Acceptable equivalents are any equivalent fraction to $\frac{29}{49}$, decimal 0.59 (...) or 59 (...)%
13 (a)	36	P1	square root of 81 eg $\sqrt{81}$ or 9 or 9×4	9 could be seen on the diagram
		A1	cao	
(b)	12	M1	finding area of triangle eg $\frac{1}{2} (16 \times 9)$ (=72)	
		M1	equating with area of parallelogram eg [area of triangle] $\times 5 = 30 \times h$ or $(h =) [\text{area of triangle}] \times 5 \div 30$ or $(h =) [\text{area of triangle}] \div 30$ or sight of 2.4	[area of triangle] must be 72 or 144 or come from $\frac{1}{2} (16 \times 9)$ or 16×9
		A1	cao	



Paper: 1MA1/3F					
Question	Answer	Mark	Mark scheme	Additional guidance	
1 (i)	43.7	B1	cao		
(ii)	$\frac{5}{7}$	B1	$\frac{5}{7}$ oe	Accept any other equivalent fraction to $\frac{5}{7}$	
2	$\frac{3}{100}$	B1	cao		
3	1.2	B1	oe	Accept $\frac{12}{10}$ or $\frac{6}{5}$	
4	90	B1	cao		
5 (a)	Cuboid	B1			
(b)	12	B1	cao		
6 (a)	Cross at $\frac{1}{2}$	B1	cross at $\frac{1}{2}$	Accept any other marks near to $\frac{1}{2}$ if the intention is clear; do not accept if any other marks are shown.	
(b)	$\frac{2}{6}$	B1	$\frac{2}{6}$ oe	Acceptable equivalents are equivalent fractions to $\frac{2}{6}$ eg $\frac{1}{3}$ decimal 0.33(...) or 33(..)%	
7	1.94 m or 194 cm	M1 A1	for 188 or 0.06 or 194 or 1.94 1.94 m or 194 cm	Do not accept numerical answers without the correct unit shown.	

Paper: IMA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
14 (a)	14	B1	for 14	
(b)	Explanation	C1	for explanation Acceptable examples she divided by 2 but should have multiplied by 2 there are 96 halves in 48 $48 \times 2 = 96$ Not acceptable examples $24 \times 2 = 48$	
15 (a)	8	B1	cao	
(b)	125	B1	cao	
16 (a)	$10m - 15$	B1	for $10m - 15$ oe	Accept any reversing of order in the expression
(b)	$3(n + 4)$	B1	for $3(n + 4)$ oe	Accept any answer in reverse order
17 (i)	Maxine with bigger number of trials	C1	for Maxine with reason Acceptable examples She throws the coin more times than Stuart Not acceptable examples Maxine throws it 50 times She gets more Tails Stuart (he)	
(ii)	$\frac{37}{60}$	B1	for $\frac{37}{60}$ oe	

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
1	500	B1	cao	
2	48 or 56	B1	for 48 or 56	Accept either or both. Do not award the mark if other numbers are shown with either.
3	1500	B1	cao	
4	9, 27	B1	cao	Do not award the mark if other numbers are shown.
5	$\frac{19}{100}$	B1	or any other equivalent fraction.	
6	16	M1 A1	for a complete method to find 20% of 80 eg 80×0.2 oe cao SC B1 for an answer of 64 or 96	
7	6	M1 A1	for interpreting the table to find the number of green counters ($26 + 7 (= 33)$) or the number of red counters ($16 + 11 (= 27)$) or the difference in circles ($26 - 16 (= 10)$) or squares ($11 - 7 (= 4)$) cao	$33 - 27 = 6$ $10 - 4 = 6$
8	39	M1 M1 A1	for finding one quarter of 52, eg $52 \div 4 (= 13)$ OR for finding the fraction to be filled, eg $1 - \frac{1}{4} \left(= \frac{3}{4} \right)$ oe for a complete method eg $52 - "13"$ or $"13" \times 3$ OR for $"\frac{3}{4}" \times 52$ cao	Accept equivalent decimals or percentages



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
1	0.309, 0.32, 0.35, 0.4	B1	for 0.309, 0.32, 0.35, 0.4	Accept written in reverse order: 0.4, 0.35, 0.32, 0.309
2	18	B1	cao	18 must be the only number selected for this award
3	5	B1	cao	
4	0.75	B1	cao	
5	700	B1	for 700 Accept 7 hundreds	
6 (a)	cross at $\frac{1}{2}$	B1	Cross (or mark) at $\frac{1}{2}$	Accept any mark near to $\frac{1}{2}$ if the intention is clear; do not accept if any additional marks are shown
(b)	cross at 0	B1	Cross (or mark) at 0	Accept any mark near to 0 if the intention is clear; do not accept if any additional marks are shown

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
20	4	P1	for start to process, eg $65 + 100 + 3 \times 5 + 1 \times 20 (= 200)$ or $3 \times 80 (= 240)$	May be part of an algebraic statement eg $65 + 100 + 35 + 10x$
		P1	for $65 + 100 + 3 \times 5 + 1 \times 20 (= 200)$ and $3 \times 80 (= 240)$ or " 240 " – $100 - 65 (= 75)$	
		P1	for process to find value of £10 notes in Carl's wallet, eg " 240 " – " 200 " ($= 40$) or for " 75 " – $3 \times 5 - 1 \times 20 (= 40)$	
		A1	cao	NB $80 - 35 (= 45)$ leading to 4 gets 0 marks
21 (a)	25	B1	cao	
(b)	Simon with reason	C1	for Simon with reason Acceptable examples Simon; he uses more trials Simon; he does 10 times more Simon, since $100 > 10$ Simon because he threw it more frequently / often Simon since he has a larger range of results Not acceptable examples Paula Simon (unsupported) Simon because he threw it 100 times He gets more tails	If figures are given as part of the answer they must be correct
22		M1	for square, side 6 cm or complete plan with incorrect scale	Do not award if the 6 cm square is included with a triangle attached externally (eg elevation)
		A1	cao	

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
12 (a)	$\frac{7}{12}$	M1	for finding two fractions with a correct common denominator, with at least one correct corresponding numerator, eg, $\frac{5}{12}, \frac{2}{12}$	Ignore errors in cancelling following sight of an equivalent fraction to $\frac{7}{12}$
		A1	for $\frac{7}{12}$ oe eg $\frac{14}{24}, \frac{21}{36}, \frac{28}{48}, \frac{35}{60}, \frac{42}{72}, \dots$	
(b)	$\frac{3}{16}$	M1	for method to multiply fractions, eg $\frac{3 \times 5}{10 \times 8} (= \frac{15}{80})$ or simplifies the calculation eg $\frac{3}{2} \times \frac{1}{8}$ or for an answer equivalent to $\frac{3}{16}$ unsimplified	
		A1	cao	
13 (a)	$\frac{4}{15}$	B1	oe	4 : 15 gets B0
(b)	0.7	B1	for 0.7 oe or $\frac{7}{10}$ oe or 70%	
14	19	M1	for a correct substitution, eg $(y =) 6 \times 4 - 5$	
		A1	cao	
15 (a)	180	M1	rounds one figure appropriately 92 to 90 or 100 or 1.63 to 2 or 1.5 or 1.6 or 1.7	Answer of 149.96 (92×1.63) gets M0A0 Answer with no working gets M0A0 Ignore further rounding of their result
		A1	for 180 ($= 90 \times 2$) or 135 ($= 90 \times 1.5$) or 144 ($= 90 \times 1.6$) or 153 ($= 90 \times 1.7$) or 200 ($= 100 \times 2$) or 150 ($= 100 \times 1.5$) or 160 ($= 100 \times 1.6$) or 170 ($= 100 \times 1.7$) or 163 ($= 100 \times 1.63$) or 184 ($= 92 \times 2$) or 138 ($= 92 \times 1.5$) or 147.2 ($= 92 \times 1.6$) or 156.4 ($= 92 \times 1.7$)	
(b)	947.2	B1	cao	



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
22	0.00128	M1 A1	for digits 128 or for correct placement of the decimal point following one arithmetical error, eg. $32 \times 4 = 138$ with an answer of 0.00138 for 0.00128 or 1.28×10^{-3}	
23	7500	M1 A1	for method to find expected number of model B, eg $\frac{15}{80} \times 40000$ oe or $\frac{15}{23+15+30+12} \times 40000$ oe cao	

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
1	6200	B1	for 6200 (accept in words)	
2	$\frac{7}{10}$	B1	or any equivalent fraction	
3	900	B1	cao	
4	12t	B1	for 12t	
5	100	B1	cao	
6 (a)	Cross marked at 0	B1		Allow if intention is clear
(b)	Cross marked at $\frac{1}{2}$	B1		Allow if intention is clear
7 (a)	9.3	B1	accept answer in the range 9.1 to 9.5	
(b)	106	B1	accept answer in the range 104 to 108	
(c)	isosceles	B1	for isosceles	Condone incorrect spelling provided intention is clear
8	96	P1	for process to find total distance before or after using scale, eg $8 + 16 (= 24)$ or “32” + “64” oe	Condone incorrect use of scale if addition seen.
		P1	for process to use scale, eg $8 \times 4 (= 32)$ or $16 \times 4 (= 64)$ or $[PR] \times 4$	where [PR] is 12 or 13 or is clearly stated
		A1	cao	



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
8	Shown	M1	for a method to find the total cost for footballs, hockey sticks or cricket bats, eg $9.5 \times 5 (= 47.5)$ or $(6 \div 2) \times 30 (= 90)$ or $23 \times 2 (= 46)$ OR begins to work with budget, eg $200 - 5 (= 195)$	Can be done with addition or subtraction, or combination
		M1	for a method to find the total cost for two of footballs, hockey sticks or cricket bats, eg two from $9.5 \times 5 (= 47.5)$ or $(6 \div 2) \times 30 (= 90)$ or $23 \times 2 (= 46)$ OR works with budget and total cost for one of footballs, hockey sticks or cricket bats, eg $200 - "47.5"$	
		M1	for a complete method to find comparable figures, eg $9.5 \times 5 + (6 \div 2) \times 30 + 23 \times 2 + 5$ or $"47.5" + "90" + "46" + 5$ or $200 - (9.5 \times 5 + (6 \div 2) \times 30 + 23 \times 2 + 5)$ or $200 - "188.5"$	
		C1	shows correct figures for a conclusion eg (£)188.5(0) or (£)11.5(0)	
9	WP WS WC BP BS BC GP GS GC	B2	for all correct and no incorrect or repeats	Ignore repeats
		(B1	for at least 4 correct)	
10	3 : 5	M1	for 24 : 40 or for any ratio equivalent to 24 : 40 or 5 : 3	Accept 3 : 5 in the form $n : 1$, eg 0.6 : 1 or 1 : n , eg 1 : 1.66(..)
		A1	for 3 : 5	
11 (a)	Unlikely	B1	cao	
(b)	Evens	B1	cao	
12	111	M1	for a complete method, eg 37×3 oe	
		A1	cao	



Paper: 1MA1/3F																	
Question	Answer	Mark	Mark scheme	Additional guidance													
19	7 cm by 8 cm rectangle drawn	M1	for interpreting the front elevation, eg length = 8 or height = 4	May be seen on diagram or in part of a calculation													
		M1	For beginning to draw plan, eg. rectangle drawn with one side length of 8 cm or one of 7cm or for interpreting front elevation to find missing dimension eg $(224 \div "8") \div "4" (= 7)$														
		C1	for correct plan drawn	May be drawn in any orientation													
20	(a)	4.68 × 10 ⁵	B1	cao													
	(b)	0.000 503 7	B1	cao													
21		80	M1	for complete method, eg 200 × 0.4 or for $\frac{80}{200}$ for the answer													
			A1	cao													
22	(a)	24.6	M1	for finding 5 products within intervals (including end points) with not more than one error, may be seen near table. eg 2 × 12.5 (= 25), 8 × 17.5 (= 140), 13 × 22.5 (=292.5), 21 × 27.5 (= 577.5), 6 × 32.5 (= 195) or for 1230	<table><tr><td>Min fx</td><td>Max fx</td></tr><tr><td>20</td><td>30</td></tr><tr><td>120</td><td>160</td></tr><tr><td>260</td><td>325</td></tr><tr><td>525</td><td>630</td></tr><tr><td>180</td><td>210</td></tr></table>	Min fx	Max fx	20	30	120	160	260	325	525	630	180	210
			Min fx	Max fx													
			20	30													
120	160																
260	325																
525	630																
180	210																
M1	for $\Sigma fx \div \Sigma f$ eg ("25" + "140" + "292.5" + "577.5" + "195") ÷ "50" or "1230" ÷ "50"	Σfx must come from 5 products, fx within intervals (including end points)															
			A1	for 24.6 oe													

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
1	tenths or $\frac{7}{10}$	B1	for (7) tenths or $\frac{7}{10}$ or 0.7	Condone incorrect spelling provided the intention is clear
2	2.4	B1	oe eg $\frac{12}{5}$	
3	$\frac{19}{100}$	B1	oe eg $\frac{190}{1000}$	
4	$\frac{4}{10}$	B1	oe eg $\frac{2}{5}$, 0.4, 40%	Accept $\frac{4}{10}$ positively indicated in the list (as long as answer line is blank)
5	Two correct factors	B1	for 2 correct factors from 1, 2, 4, 8, 16, 32 and no incorrect factors	Accept one correct product
6	28	P1 P1 A1	for a process to work out the value of the £20 notes, eg $6 \times 20 (= 120)$ oe for a process to work out the value of the £10 notes, eg $400 - "120" (= 280)$ oe allow £28	Build up processes are allowed. Condone one error in the build-up process. If 28 seen but 10 or 280 on answer line award P2A0 eg '28 notes of £10' then 10 or 280 on answer line
7 (a)	Mark at $\frac{1}{6}$	B1	for mark at $\frac{1}{6}$	Accept indications other than a cross, eg an arrow pointing to the correct position.
(b)	Mark at $\frac{2}{6}$	B1	for mark at $\frac{2}{6}$	



Paper 1MA1: 2F				
Question	Working	Answer	Mark	Notes
17		98	P1	for process to find P(1), e.g. $1 - 0.17 - 0.18 - 0.09 - 0.15 - 0.1 (= 0.31)$ or for a process to find P(1 or 3), e.g. $1 - 0.17 - 0.09 - 0.15 - 0.1 (= 0.49)$
			P1	for process to find the number of 3s, e.g. $0.18 \times 200 (= 36)$ or process to find the number of 1s, e.g. $P(1) \times 200 (= 62)$, or process to find the number of (1 or 3)s, eg $[P(1) + 0.18] \times 200$ or process to find any expected frequency, using any probability $\times 200$, eg 0.17×200
			A1	cao
			OR	
		98	P1	for process to find P(2 or 4 or 5 or 6), eg $0.17 + 0.09 + 0.15 + 0.1 (= 0.51)$
			P1	for process to find the number of (2 or 4 or 5 or 6)'s, eg $"0.51" \times 200 (= 102)$
			A1	cao



Paper: 1MA1/2F				
Question	Working	Answer	Mark	Notes
18 (a)		31.4	P1	for working with circumference formula, eg $\pi \times 80$ (=251.(...)) oe
			A1	for answer in the range 31.4 to 31.5 accept 10π
(b)		No (supported)	C1	Mean distance stays the same with reason, eg total distance remains unchanged or same number of points
19		$\frac{1}{11}$	P1	for starting the process, eg by writing down a correct ratio or using a given number of cubes for one relationship, eg 2B 1Y or B:Y = 2:1 or 4G 1B or G:B = 4:1 or 8G, 1Y or G:Y = 8:1 oe or yellow = 2, blue = 4, or states 2:1:8 oe in any order (can be algebraic)
			P1	for complete process to find possible number of each colour or equivalent ratio, eg 8G 2B 1Y or G:B:Y = 8:2:1 oe or yellow = 2, blue = 4, green = 16 oe (can be algebraic)
			A1	$\frac{1}{11}$ oe
20 (a)		(-2, 1) (-4, 1) (-2, 2) (-5, 2)	B1	Shape labelled A
(b)		(1, -4) (3, -4) (1, -5) (4, -5)	B1	Shape labelled B



Paper: 1MA1/3F				
Question	Working	Answer	Mark	Notes
24		147	P1 P1 P1 A1 B1	starts process, eg uses x and $x + 7$ starts to work with at least 6 correct sides, may be on the diagram or in an expression (dep on previous P1) gives a correct expression for the perimeter, eg $x + x + 7 + x + 7 + x + 7 + x + x + 7 + x + 7 + x + 7$ or adds at least 6 correct sides and equates to 70 for width = 3.5 oe and length = 10.5 oe ft (dep P2) for correct area for their x
25		0.0007452	M1 A1	for digits 7452 seen cao
26 (a)		Mel (supported)	B1	Mel with reference to greatest number of throws
(b)		$\frac{2}{9}$	M1 A1	selects overall total and multiplies $P(\text{point up}) \times P(\text{point down})$ eg $\frac{50}{150} \times \frac{100}{150}$ oe (accept $\frac{14}{45} \times \frac{31}{45}$ or $\frac{27}{80} \times \frac{53}{80}$ or $\frac{9}{25} \times \frac{16}{25}$) for $\frac{2}{9}$ oe



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
15	6	P1 P1 A1	for listing the multiples of 3 and 5 to at least the number 15 or $3 \times 5 (= 15)$ for considering multiples of 15, eg 4 multiples of 15 identified or $100 \div 15 (=6.6..)$ or an answer of 7 cao	3, 6, 9, 12, 15 and 5, 10, 15 If in a list of multiples of 3 and 5, multiples of 15 must be clearly identified Sight of 6.6(...) or $6\frac{2}{3}$ oe or an answer of 7 gets 2 marks.
16	30:1	M1 A1	for stating $450 : 15$ oe or $450 \div 15 (=30)$ oe or $1 : 30$ cao	$90 : 3$ Ignore units throughout.
17 (a)	Full working seen	M1 M1 C1	for an initial step with the expressions eg doubling $2x + 1$ or $x + 2$ or halving $4x$ or for identifying CD as $x + 2$ or for identifying DE as $2x + 1$ for an expression for the total perimeter, eg $4x + 2 \times (2x + 1) + 2 \times (x + 2)$ for full simplification and equating to 18	May be seen in working or on diagram
(b)	1.2	M1 A1	for isolating terms in x can fit an equation stated in (a) provided in form $ax + b = c$ for 1.2 oe	$10x = 18 - 6$ Accept $\frac{12}{10}$ or $\frac{6}{5}$

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
16 (a)	$\frac{5}{11}$	M1	for $\frac{5}{n}$ where $n > 5$ or $\frac{m}{11}$ where $m < 11$	where "11" comes from 5+2+4
		A1	for $\frac{5}{11}$ oe	Accept any equivalent fraction, decimal form 0.45(45...) or percentage form 45(.45...)%
		B1	for 0.7 oe	Accept any equivalent fraction eg $\frac{7}{10}$ or percentage form eg 70%
17	accurate drawing	M1	for drawing a side of length 6cm	
		A1	for correct triangle	
18	258 to 275	M1	for taking a correct reading from the graph that shows conversion of an amount in \$ to £	
		M1	for a complete method eg attempts to read from the graph at using numbers that sum to 345 and finds the sum of their readings eg $6 \times 50 + 45$	Must be a complete method to get to 345
		A1	for answer in the range 258 to 275	Condone incorrect money notation if the meaning is clear
19 (a)	140	M1	for complete method eg $56 \div 40 \times 100$	May be seen in different ways, eg 2.5×56
		A1	cao	
	32	M1	for method to find percentage, eg $\frac{18}{56} \times 100 (=32.14...)$	
		A1	for an answer in the range 32 to 32.2	



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
8	7	P1 P1 A1	for $6 + 4 + 5 + 8 + 7 + 5 (= 35)$ for “35” $\div 5$ cao	Working may be seen on the diagram Allow one error in the 6 readings; intention to add must be clear.
9	Explanation	C1	for explanation, Acceptable examples Answer should be 14 Should work out 3×4 first Alec should times first instead of adding Not used BIDMAS/BODMAS BIDMAS/BODMAS He has done it in the wrong order Alec needs to use brackets so $2 + (3 \times 4)$ Because you always do multiplication or division first Not acceptable examples Because the answer is wrong It is $2 + (3 \times 4) = 15$ It needs brackets Because working out should only be one sum	
10	$\frac{17}{30}$	B1	for $\frac{17}{30}$ or any equivalent fraction	
11	Reflection	M1 A1	for a correct reflection of the shape in any horizontal line other than the given mirror line for a fully correct reflection	Allow free hand drawing



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
7 (a)	A	B1	cao	
(b)(i)	Cross at correct position	B1	for cross at $\frac{1}{4}$	Cross or other indication may be seen on or near line provided within tolerance
(b)(ii)	$\frac{1}{8}$	B1	for $\frac{1}{8}$ oe	Accept any equivalent fraction, decimal form 0.125 or percentage form 12.5% Do not accept 1 : 8 or 1 to 8 or 1 out of 8
8 (a)	7	B1	cao	
(b)	6	M1 A1	for $4n$ ($= 24$) or $24 \div 4$ cao	
9 (a)	290	B1	cao	Accept 290°. May be seen on diagram provided no ambiguity
(b)	reason	C1	for correct reason: <u>Angles</u> at a <u>point</u> add to 360	The key words underlined must be present with the 360 implied if not stated by use in part (a)



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
15	Spinner (supported)	P1	for a process to express one relationship, eg $\frac{2}{6}$ oe or $\frac{3}{8}$ oe or 2 : 4 oe or 3 : 5 oe or 2 : 6 oe or 3: 8 oe	Allow use of words to describe relationship, eg 2 out of 6
		P1	for process to express both relationships, eg $\frac{2}{6}$ oe and $\frac{3}{8}$ oe or 2 : 4 oe and 3 : 5 oe or 2 : 6 oe and 3: 8 oe	
		C1	for indicating (number greater than 5 on) spinner supported by correct values, eg $\frac{8}{24}$ and $\frac{9}{24}$ or 0.33(3..) and 0.37(5) or 33(.3..) % and 37(.5) % or 10 : 20 and 12 : 20 or 16 : 48 and 18 : 48	Conclusion may be indicated in body of question eg circling spinner or phrase
16	98	M1	for method to use speed, distance and time, eg $56 \times [\text{time}]$ or $56 \times 105 (= 5880)$ or $56 \div 4 \times 3 (= 42)$ or $56 \div 60 (= 0.933...)$ OR for method to convert decimal time, eg $(60 + 45) \div 60 (= 1.75)$ or $45 \div 60 (= 0.75)$	For this mark accept [time] written unconventionally eg as 1.45, 145, 175, 75
		M1	for a complete method using decimal time, eg $56 \times "1.75"$ or " 5880 " $\div 60$ or " $0.933...$ " $\times 105$ or $56 + "42"$ or $56 + "28" + "14"$	
		A1	for 97.65 to 98.3	



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
1	3107	B1	cao	
2	30	B1	cao	
3	4m	B1		
4	4	B1	cao	
5	-5, -2, 3, 7, 9	B1	cao	Accept in reverse order
6 (a)	14	B1	cao	
(b)	18	B1	cao	
7 (a)	evens	C1	oe	Accept 60% or an equivalent fraction eg $\frac{6}{10}$
(b)	certain	C1	oe	
(c)	0.6	B1	oe	
8 (a)	Square	C1	for statement of shape	Accept unambiguous misspellings.
(b)	Cuboid	C1	for statement of solid	Accept unambiguous misspellings. Accept square based prism

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
8 (a)	11, 7, 6	B2	for all frequencies correct	Any discrepancy mark frequencies
		(B1)	for two tallies or two frequencies correct	
	Castle	B1	Castle or ft their tallies or frequencies	Any discrepancy ft frequencies
		B1	for correct place labels or a linear scale	
(c)	Bar chart	M1	for at least two correct bars ft their table in (a)	Accept key in place of labels Accept unambiguous abbreviations for labels eg C, F, M Condone bars of varying widths Condone no gaps or inconsistent gaps Bars must be unambiguously correct for their scale
		A1	for a fully correct bar chart with linear scale of numbers on the vertical axis and a set of place labels on the horizontal axis (ft from their frequencies or tallies in (a))	
9 (i)	$\frac{9}{22}$	B1	oe	If incorrect notation used in both (i) and (ii), penalise once only in (i)
	$\frac{14}{22}$	B1	oe eg $\frac{7}{11}$	
	0	B1		



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
12	6	P1 P1 P1 A1	for process to find perimeter of triangle eg $14 + 30 + 36 (= 80)$ for " $80 \div 4 (= 20)$ " for a complete process eg " $(20 - 4 - 4) \div 2$ or " $20 \div 2 - 4$ " cao	$36 \div 4 + 14 \div 4 + 30 \div 4 (= 20)$ scores P1P1
13 (a)	1	B1	Allow 100%	Allow $\frac{k}{k}$ Do not accept 100, do not accept certain.
(b)	$\frac{2}{3}$	P1 A1	for start of process to write down proportion of each coin, writes down a correct ratio, eg $1p : 2p = 2 : 1$ oe or a process to work out number of 1p coins and 2p coins, eg $40 \div 2 (= 20)$ and $(40 \div 2) \div 2 (= 10)$ or assigns numbers in correct proportion, eg 6 1p coins and 3 2p coins or finding the probability of a 2p coin $(= \frac{1}{3})$ for $\frac{2}{3}$ oe	Accept any equivalent fraction, decimal form, 0.66(6...) or 0.67 or percentage form, 66(.6...) % or 67%

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
14 (a)	No (supported)	C1	No and explanation eg “it is $\frac{1}{6}$” or “each number is the same probability” Acceptable examples No, they are both $\frac{1}{6}$ (accept 1 in 6 or 1 : 6 etc) No, they are both the same No, an equal chance No, it's a fair dice No, there's only one of each number Not acceptable examples No, it's an even chance No, it's 50 – 50 No, 1 : 6	
(b)	No (supported)	C1	No and explanation eg “it is out of 36” or “it is $\frac{1}{6}$ times $\frac{1}{6}$” Acceptable examples No, the probability is $\frac{1}{36}$ No, it's out of 36 No, he should times not add Not acceptable examples No, it's $\frac{1}{6} \times \frac{1}{6}$, the probability is $\frac{1}{12}$ No, he's more likely to get it once only No, there's only one 6 on a dice No, you will have a $\frac{2}{12}$ chance	
(c)	1H, 2H, 3H, 4H, 5H, 6H, 1T, 2T, 3T, 4T, 5T, 6T	B2 (B1)	for all 12 outcomes with no extras or repeats for at least 6 correct outcomes, ignoring extras and repeats)	Pairs must be unambiguous Accept words and abbreviations

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
12	Correct pie chart	M1 A1 A1	for method to find at least one angle eg P: $360 \div 60 \times 24 (=144)$ or C: $360 \div 60 \times 16 (=96)$ or M: $360 \div 60 \times 20 (=120)$ for all 3 angles correctly calculated OR at least one accurately drawn angle fully a correct labelled pie chart	Use the overlay Working may be seen in or by the table If three equal sectors of 120° with no working award 0 marks Labels as “vegetables” from table not just angle size. Accept P, C, M
13	50	P1 P1 P1 A1	for $45 \times 1.2 (=54)$ or $34 \times 1.5 (=51)$ for $150 - “54” - “51” (=45)$ for $“45” \div 0.9 (=50)$ cao	
14	(a) 0.3 (b) 4 (c) 12	B1 B1 M1 A1	for 0.3 oe 4 or ft their (a) for 0.2×60 oe cao	Acceptable equivalents are 3/10 or 30% Answer on answer line takes precedence Do not accept a statement of probability (eg 0.1) Do not accept the use of any other probability

Paper: 1MA1/1F								
Question	Answer	Mark	Mark scheme	Additional guidance				
21	14	P1	for process to find total number of boys, $40 - 22 (= 18)$ OR the number of girls who travel by bus $10 - 6 (= 4)$		W	C	B	
				boy	5	(7)	(6)	18
		P1	for process to find the number of girls who cycle to school $22 - "4" - 9 (=9)$ OR the number of boys who walk to school $"18" - 6 - 7 (= 5)$	girl	(9)	9	4	(22)
				14	16	(10)	(40)	
		P1	full process to find the total number of students who walked to school eg $"5" + 9$ or $40 - (6 + 7 + "4" + "9")$	Note 16 is 7+9 and 10 is 6+4 6+7 is 13 and 4+9=13 may be seen as intermediate steps				
		A1	cao					
22 (a)	0.4, 0.4	P1	for process to find sum of unknown probabilities, eg $1 - 0.2 (= 0.8)$	Award mark for any two probabilities given that sum to 0.8, eg given in the table				
		A1	oe	Accept any equivalent fraction or 40%				
		(b)	60	P1	for complete process to find total number of cubes, eg $12 \div 0.2$ or 12×5 or $("0.4" \div 0.2) \times 12 + ("0.4" \div 0.2) \times 12 + 12$ OR states $0.1 = 6$ or $0.4 = 24$			
				A1	cao			



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
16	blue 0.15 green 0.2	P1	for $1 - 0.4 - 0.25$ ($=0.35$) oe	May work in percentages, condone missing % sign If the two numbers in the table sum to 0.35 that implies P1 One correct value in the table implies P2 7 can come from 3+4 Accept answers given in decimals, fractions or percentages.
		P1	for using the ratio, eg " $0.35 \div (3 + 4)$ " ($=0.05$) or " $0.35 \times \frac{3}{7}$ " ($=0.15$) or " $0.35 \times \frac{4}{7}$ " ($=0.2$)	
		P1	for a complete process $3 \times "0.05"$ ($=0.15$) and $4 \times "0.05"$ ($=0.2$) or " $0.35 - "0.15"$ " ($=0.2$) or " $0.35 - "0.2"$ " ($=0.15$) or green 0.15, blue 0.2	
		A1	oe	
17	(a) -10, -6, 2, 6 (b) Graph drawn	B2	for 4 values correct -10, -6, (-2), 2, 6, (10)	
		(B1	for 2 or 3 values correct)	
		M1	(ft from (a) if B1 awarded) for at least 5 points correctly plotted.	
		A1	correct graph drawn from $x = -1$ to 4	
18	Correct reflection	B2	correct triangle drawn with vertices (1, 2) (2, 2) (1, -1)	
		(B1	for a correct reflection in the line $y = a$ or a correct reflection in the line $x = 3$, or triangle in correct orientation with 2 of 3 vertices correct)	

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
25	12	P1	for a process to find the fifth term eg $3a + 5a (=8a)$	[8a] allow use of what is clearly indicated as the missing term $\frac{228}{19}$ or $\frac{228}{1+2+3+5+8}$ scores P1 P1 $\frac{228}{1+2+3+5+8}$ scores P0 P1
		P1	for setting up the equation eg $a + 2a + 3a + 5a + [8a] = 228$	
		A1	cao	
26	(a)	P1	for $1 - 0.05 - 0.15 (=0.8)$	Award this mark for any two probabilities that sum to 0.8
		A1	oe	
	(b)	M1	$18 \div 0.15$ oe or $6 + 18 + a + b$ where $a + b = 96$	
		A1	cao	
27	18.3	P1	for finding the area of the triangle eg $0.5 \times 8 \times 8 (=32)$	Accept rounded or truncated figures If the answer is given within the range but then rounded incorrectly award full marks.
		P1	for finding the area of the circle $\pi \times 8 \times 8 (=201.06..)$	
		P1	for finding the area of the sector eg $\frac{1}{4} \times \pi \times 8^2$ or "201.06.." $\div 4 (=50.26..)$	
		A1	for an answer in the range 18.2 to 18.3	
28	Sketch	M1	correct shape in one of the required quadrants or correct graph where the lines touch the axes	Lines do not need to extend to the ends of the axes if the intention is clear
		A1	fully correct shape	



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
8	(a) 28 33	B1	cao	One correct, one incorrect statement gets C1 as long as they are not contradictory.
	(b) Explanation	C1	for explanation Acceptable examples all terms end in 3 or 8 there are no terms that end in 0 50 does not end in 3 or 8 48 and 53 are both in the sequence (could be shown) 48 is in the sequence and 50 is 2 more $5n-2=50$ so n is not a whole number. if it started at 0 then it would but it starts at 3 so it never will or shows sequence continuing up to and beyond 50 Not acceptable examples adding 5 each time will not lead to 50 (insufficient) it goes past 50 the closest number to 50 is 48	
9	(a) 5	B1	cao	
	(b) 9	B1	cao	
10	(a) cross at 0	B1	cao	To fit “5” the “5” needs to be clearly stated as being the number of even numbers; otherwise accept 5 only; could be indicated alongside the given numbers. Could be written as a decimal (0.62, 0.625 or 0.63) or equivalent percentages to these
	(b) cross at $\frac{1}{2}$	B1	cao	
	(c) $\frac{5}{8}$	M1	“5” for $\frac{5}{a}$ where $a > “5”$ or $\frac{b}{8}$ where $b < 8$ or for identifying all the even numbers, 2, 6 and 8 or for writing the correct probability using the wrong notation eg 5 : 8	
		A1	for $\frac{5}{8}$ oe	

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
23	70	P1	for process to find number of discs in the bag, eg $24 \div 0.16 (= 150)$ or for process to find the total probability of red or blue, eg $1 - 0.16 \left(= 0.84 \text{ or } \frac{21}{25} \text{ oe} \right)$	May be implied by 126
		P1	for process to work with ratio, eg $([\text{total}] - 24) \div (5 + 4) (= 14)$ or for a process to find the probability of red, eg $[\text{probability}] \div (5 + 4) \times 5 \left(= 0.46... \text{ or } \frac{7}{15} \right)$	0.46 or better or 0.47 may imply P2 [total] can be any integer [probability] can be any value less than 1
		P1	for a complete correct process to find the number of red discs, eg “14” $\times 5$ or “0.46...” $\times 24 \div 0.16$ or an answer of $\frac{70}{150}$	If correct processes seen to find the total for both red and blue or 70 : 56 award P3 Must come from correct use of probability and ratio in either order
		A1	for 70	If the values for red and blue are found, the value for red must be clearly identified as the answer to gain A1



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
19 (a)	75	P1	for process to find sum of unknown probabilities eg $1 - (0.10 + 0.30 + 0.05 + 0.25) (= 0.3)$ oe or for process to find number of times dice lands on 3, 4, 5 or 6 eg $(0.10 + 0.30 + 0.05 + 0.25) \times 500 (= 350)$ oe	Award mark for any two probabilities that sum to 0.3 eg in the table or probability of 2 = 0.15
		P1	for a complete process, eg $(“0.3” \div 2) \times 500$ oe or $(500 - “350”) \div 2$ oe	P1P1A0 for answer of 75:500 or $\frac{75}{500}$
		A1	cao	
(b)	Answer to part (a) will be greater	C1	for an explanation that the answer will be greater Acceptable examples It makes the answer an underestimate The number will be higher The answer will increase / will go up The number of 2's will increase It would be more than [75] Not acceptable examples My answer will change My answer is incorrect The calculation will change The probability will change It would make the probability of 2 go up My answer won't change	Where [75] is their answer to (a)

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
15	10	P1	for process to find total number of buttons $20 + 12 (= 32)$	
		P1	for process to work with probability, eg $"32" \div 4 (= 8)$ or $"32" \div 4 \times 3 (= 24)$	May be implied by $\frac{8}{32}$
		P1	for process to find number of extra blue buttons required, eg $"8" - 6 (= 2)$ or for process to find number of extra reds, eg $12 - ("8" - 6)$ or for process to find new total number of red buttons, eg $(6 + 5 + 12) - "8" (= 15)$ or $"32" - "8" - 9 (= 15)$ or $"24" - 9 (= 15)$	May be implied by $8 : 9 : 15$ or $\frac{10}{32}$
		A1	(dep P2) cao	Answer of 10 only scores no marks
16 (a)	70	M1	for a method to work with distance $\div$ time, eg $35 \div (30 \div 60)$ or $35 \div 30 \times 60$ or $35 \times (60 \div 30)$ or $35 \div 30 (= 1.16...)$ or [distance] $\div$ [time]	May use other readings from graph for [distance] and [time] but must be accurate
		A1	answer in the range 69.6 to 70.2	
(b)	Graph drawn	C1	for a line from (30, 35) to (45, 35)	
17	1350	P1	for working with percentage, eg $85 \div 100 \times 9000 (= 7650)$ or $(100 - 85) \div 100 (= 0.15)$ or 0.15×9000	Allow $\frac{15}{100}$ and 15% but not 15 alone
		P1	for a complete process, eg $9000 - "7650"$ or $(100 - 85) \div 100 \times 9000$	15% $\times$ 9000 is not acceptable unless correctly evaluated
		A1	cao	

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
7 (a)	D	B1	cao	
	(b) B	B1	cao	
	(c) Shown	M1	for number of green counters, eg $12 - (3+1+2) = 6$ OR for $\frac{3}{12}$ oe $\frac{1}{12}$ oe $\frac{2}{12}$ oe linked to the appropriate colour	This is awarded for a correct first step
		M1	for $1 - (\frac{3}{12} + \frac{1}{12}) (= \frac{8}{12})$ or $\frac{2}{12} + \frac{6}{12} (= \frac{8}{12})$ OR for method to find $\frac{2}{3}$ of 12, eg. $12 \div 3 \times 2 (= 8)$	This is awarded for a fully correct method from which the correct answer of $\frac{2}{3}$ can be found Sight of $\frac{8}{12}$ gets M2
		C1	for correct conclusion supported by accurate figures, eg $\frac{8}{12} = \frac{2}{3}$ or $\frac{2}{3}$ of 12 = 8 and number of yellow + green = $2 + 6 = 8$	
8	36	M1	for method to find cost of 1 kg, eg $54 \div 3 (= 18)$ or $54 \div 3 \times 2$ oe	
		A1	cao	
9 (a)	Radius	B1	cao	Accept spelling mistakes
	Tangent	B1	cao	Accept spelling mistakes



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
24 (a)	8	P1	for process to find sum of unknown probabilities, eg $1 - 0.45 - 0.25 (= 0.3)$ OR to find the total number of counters in the bag, eg $\frac{18}{0.45} (= 40)$ OR to find the number of yellow counters, eg $\frac{0.25}{0.45} \times 18 (= 10)$	Award mark for any two probabilities given that sum to 0.3 eg given in the table.
		P1	for process to find $P(\text{red}) = 0.2$ oe or $P(\text{white}) = 0.1$ oe OR for process to find the total number of red and white counters, eg “40” – 18 – “10” (=12) OR for process to derive an equation in x , eg $2x + x = 1 - 0.45 - 0.25$ or $2x + x = “0.3”$ or $x = 0.1$	Award P2 for $P(\text{red})$ or $P(\text{white})$ (could be shown in table) Equations could be given as written statements or working but must be fully equivalent.
		P1	for a complete process to find the number of red counters, eg $\frac{2 \times 0.1}{0.45} \times 18$ or $\frac{2}{3} \times “12”$ or $0.2 \times “40”$ or $\frac{0.2}{0.025}$	
		A1	cao	
(b)	Explanation	C1	for explanation eg 0.5 multiplied by an odd number will never be a whole number, for half of a number to be an integer that number must be even, you can't have half a marble	

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
16 (a)(i)	B	B1	for B, accept 0.033 on the answer line	Accept rounded conversions seen to decimals or percentages if the reasoning is correct
(ii)	C	B1	for C, accept $\frac{1}{3}$ on the answer line	
(b)	Statement	C1	eg No with $(\frac{1}{3})$ and $\frac{2}{3}$ or No, probabilities would need to be $\frac{1}{2}$ or No since $\frac{1}{3} + \frac{1}{3}$ does not equal 1 or No since tails is 67% (or 0.67)	
(c)	132	M1	for 4000×0.033	
		A1	OR $\frac{132}{4000}$ cao	

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
17 (a)	$\frac{70}{100}$	M1	for $100 - 30 (= 70)$ or $\frac{30}{100}$ oe	Accept any equivalent fraction, decimal form 0.7 or percentage form 70%
		A1	for $\frac{70}{100}$ oe	
	45	P1	for start to process, eg $30 \div 2 (= 15)$	
		A1	cao	
	No with reason	C1	for No with reason or ft (b)	
			Acceptable examples the number of red and yellow counters is an odd number 25 cannot be divided by 2 to give a whole number You can't have half a counter You can't split it evenly Not acceptable examples Yes they are in the ratio 2 : 3 one must be more than the other	

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
20 (a)	0.4 oe	P1	for $1 - 0.3 - 0.1 (= 0.6)$ or $0.3 + 0.1 + 2x + x = 1$	Award this mark for any two probabilities that sum to 0.6 Allow P1P1A0 for $P(\text{green}) = 0.4$ Award P1P1A0 for 0.4 with incorrect subsequent working eg $\frac{0.4}{0.6}$ If no answer on answer line then check table A0 for $\frac{0.4}{1}$
		P1	for $"0.6" \div 3 (= 0.2)$ or $3x = "0.6"$	
		A1	for 0.4 oe	
	(b) 150	M1	for complete method to find the total number of counters eg $45 \div 0.3$ or $45 \div 3 \times 10$ oe or $45 + 45 \div 3 + 45 \div 3 \times 4 + 45 \div 3 \times 2 (= 45 + 15 + 60 + 30)$	
		A1	cao	
21 (a)	(2), -2, (-4), -4, -2, 2	B2	for all 4 values correct	Accept a freehand curve drawn that is not made of line segments Curve must not have a horizontal segment between $(-1, -4)$ and $(0, -4)$ Ignore anything drawn outside the required range
		(B1	for 2 or 3 correct values)	
		B2	for a fully correct graph	
	(b) Graph drawn	(B1	fit (dep on B1 in (a)) for plotting at least 5 of the points from their table correctly)	
		B1	fit their graph with a single turning point or for x coordinate = -0.5 and y coordinate = -4.25 oe	
(c)	-0.5, -4.25	B1	fit their graph with a single turning point or for x coordinate = -0.5 and y coordinate = -4.25 oe	



Paper 1MA1: 1F				
Question	Working	Answer	Mark	Notes
16 (a)		Explanation	C1	eg States over-estimated for both values
(b)		182.7(0)	P1	for a process to find 10% of a value stated in the question eg $\frac{10}{100} \times 5.80 (=0.58)$ or $\frac{10}{100} \times 35 (=3.5)$ oe or $35 \times 5.80 (=203)$, allow $30 \times 5.80 (=174)$ or $35 \times [\text{reduced price}]$
			P1	for a process to find 90% of a value stated in the question eg $35 - "3.5" (=31.5)$ or $0.9 \times 5.80 (=5.22)$ oe or $\frac{10}{100} \times "203" (=20.3)$ or $\frac{10}{100} \times "174" (=17.4)$ oe
			P1	for a complete process to find actual cost of 35 eg $0.9 \times 5.80 \times 35$ oe
			A1	cao
				SC B2 156.6(0)
17		$\frac{4}{9}$	M1	for listed outcomes (allow 1 error eg omission or repeat) or fractions $\frac{1}{3} \times \frac{2}{3} + \frac{2}{3} \times \frac{1}{3}$
			A1	for $\frac{4}{9}$ oe
18		135	M1	for $450 \div "2+3+5" (=45)$ or $\frac{3}{10} \times 450 (=135)$ or 5 parts are 225 or 2 parts are 90 indicated
			A1	Cao



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
1	0.45	B1	cao	
2	2 factors	B1	at least 2 of 1,5,7,35	No incorrect factors
3	10 45	B1	for 10 45	Accept any time notation
4	11	B1	cao	
5	Midpoint marked	B1	within tolerance	
6	(a) $4ab$	B1		
	(b) $3x + 8$	M1	for method to collect terms eg $3x$ or 8	May be seen in working. Accept if no ambiguity.
		A1	for $3x + 8$	
7	EJ, EK, FJ, FK, GJ, GK	B2 (B1)	fully correct list with no repeat for at least 4 correct	Allow letters in either order
8	2540 shown	M1 M1 A1	for finding the cost of one item eg $2 \times 600 (=1200)$ or $7 \times 120 (=840)$ or $2 \times 250 (=500)$ full process eg “1200” + “840” + “500” (=2540) or $2500 - “1200” - “840” - “500” (= \pm 40)$ for 2540 or ± 40	Ignore written statements as long as the correct figures are shown



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
14	Completed table	M1	for correctly entering two of 11, 2, 5, 10 ($= 30 - 20$)	4 2 4 10 1 8 11 20 5 10 15 30
		M1	(indep) for using the rule for the top row eg. $([10 \text{ males}] - [2 \text{ male tennis}]) \div 2 (=4)$	Award 2 nd M1 if top row is correct
		A1	for complete correct table	
15	7	P1	for $750 \times 9 (=6750)$ or $1 + 9 (=10)$ or $750 \div 1000 (=0.75)$	
		P1	(dep) for “6750” + 750 ($=7500$) or for “10” $\times$ 750 ($=7500$) or “0.75” $\times$ “1 + 9” ($= 7.5$)	
		A1	cao	
			Alternative	
		P1	for $100 + 900 (= 1000)$	
		P1	(dep) for $750 \div 100 (= 7.5)$	
		A1	cao	This can be implied by (1 litre of drink $\Rightarrow$) 100 (ml) of squash and 900 (ml) of water



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
9	$\begin{array}{ccccc} 4 & \mathbf{5} & 23 & \mathbf{32} \\ \mathbf{8} & 9 & 7 & 24 \\ \mathbf{12} & \mathbf{14} & 30 & \mathbf{56} \end{array}$	B3 (B2) (B1)	for a fully correct table for at least 7 figures correctly placed) for the given values correctly placed in the table or one correct row or column)	Given values in bold Given values: 5, 32, 8, 12, 14, 56
10	61	P1 A1 A1	for $300 \div 4.85 (= 61.8\dots)$ for 61.8... or 62 61	This mark may be awarded for build-up methods that get to figures that are before or after 300 Embedded answers get –1 mark.
11 (a)	3 hrs 16 mins	P1 A1	$196 - 60 - 60 - 60 (=16)$ or $196 \div 60 (= 3.26\dots \text{ or } 3.27\dots)$ or states 3 hours in their answer (with an incorrect number of minutes or minutes left blank) 3 hours 16 minutes	
(b)	$\frac{x}{2}$	B1	$\frac{x}{2}$ or	
12 (a)	50	M1 A1	$[2.5] \times 20 (=50)$ for an answer in the range 46 to 54	[2.5] a number in the range 2.3 to 2.7 or identified as the distance from Shelton to Trilby
(b)	60	M1 A1	$5 \times 1200 (=6000)$ or $1200 \div 100 (=12)$ or conversion $5 \div 100 (=0.05)$ cao	

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
12 (a)	9	B1	cao	÷11 and -8 could be seen in a flow diagram Evidence could be provided by algebraic statement, numerical statements or by diagram
(b)	6	M1	starts to find input using inverse operations eg $154 \div 11 (= 14)$ or indicates $\div 11$ and $- 8$ or derivation of equation eg $(8 + n) \times 11 = 154$ or starting to solve for unknown eg $154 - 8 \times 11 (= 66)$	
		A1	cao	
13	53 19 67 139 17 26 16 59 70 45 83 198	B3 (B2) (B1)	for a fully correct table for at least 7 figures correctly placed for the 4, 5 or 6 values correctly placed	
14 (i)	>	B1	cao	
(ii)	=	B1	cao	
15 (a)	774	M1	for at least three of $0 \times 3 (= 0)$ or $1 \times 57 (= 57)$ or $2 \times 84 (= 168)$ or $3 \times 75 (= 225)$ or $4 \times 81 (= 324)$ or for $0 \times 3 + 1 \times 57 + 2 \times 84 + 3 \times 75 + 4 \times 81$	Note if 2 non zero products are seen award M1 Use of the figure 777 is enough for M1
(b)	3	A1 M1 A1	cao for method to begin to work with the median, eg $300 \div 2 (= 150)$ cao	Accept 301 in place of 300 NB mean = 2.58



Paper: 1MA1/3F																									
Question	Answer	Mark	Mark scheme		Additional guidance																				
22	Description	C1	Identifies a mistake in the working Acceptable examples Rob should divide by 8 He should have added the 3 and 5 first He divided 120 by 3 and 5 instead of 8 He did not do it as $120 \times \frac{3}{8}$ and $120 \times \frac{5}{8}$ He did not add the two ratios first Not acceptable examples He has done it in two parts but he should do it in one The answer should be 45 : 75 They do not add up to 120 He is supposed to add his numbers 40 + 24 does not equal 120																						
23	22	P1 P1 A1	for process to find total choosing German eg $200 - 104 - 70 (=26)$ for complete process to find boys choosing Spanish eg $90 - (60 + ("26" - 18))$ cao	for process to find girls choosing French (44) or total number of girls (110) for complete process to find boys choosing Spanish eg $70 - ("110" - "44" - 18)$	<table><tr><td></td><td>F</td><td>S</td><td>G</td><td>total</td></tr><tr><td>girls</td><td>44</td><td>48</td><td>18</td><td>110</td></tr><tr><td>boys</td><td>60</td><td>22</td><td>8</td><td>90</td></tr><tr><td>total</td><td>104</td><td>70</td><td>26</td><td>200</td></tr></table>		F	S	G	total	girls	44	48	18	110	boys	60	22	8	90	total	104	70	26	200
	F	S	G	total																					
girls	44	48	18	110																					
boys	60	22	8	90																					
total	104	70	26	200																					

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
11 (a)	Shown	M1	for a correct first step, eg method to convert, $4 \times 60 (= 240)$ or $75 \div 60 (= 1.25)$ or $150 \div 60 (= 2.5)$ or accurate converted time shown, eg 1(hr) 15(mins) oe or 2(hrs) 30(mins) oe or adding the two required times $150 + 75 (= 225)$	Units not required but if stated they must be correct.
		C1	for accurate figures to compare, eg 240 and 225 (mins) or 3.75(hrs) or 3(hrs) 45(mins) or 15 mins spare (from $240 - 150 - 75$)	Units not required but if stated they must be correct. An incorrect conversion will score C0, eg 3.75 incorrectly converted to 3hrs 75mins Figures are enough and a direct comparison to 4 hrs is not needed Condone $65 \times "120"$
(b)	130	M1	for 2×65 oe	
		A1	cao	
12	75 7 20 102 35 98 5 138 110 105 25 240	B3	for a fully correct table	
		(B2)	for 7, 8, 9, 10 or 11 entries correctly placed)	
		(B1)	for 6 entries placed correctly)	
13 (a)	n^3	B1	cao	
(b)	6	M1	for isolating k terms, eg $5k = 26 + 4$ or $5k = 30$ or $k - \frac{4}{5} = \frac{26}{5}$ oe or $26 + 4 \div 5$	For M mark step must be carried out not just intention shown. For example, if you see $5k - 4 = 26$ +4 +4 award M1 for $5k = r$ where $r > 26$
		A1	cao	



Paper 1MA1: 1F													
Question	Working	Answer	Mark	Notes									
8		4×8 rectangle drawn	M1 A1	Draws a rectangle with side lengths in the ratio 2:1 or lists possible dimensions in the ratio 2:1 or gives two numbers which multiply to 32 for correct diagram on grid									
9		Identifies error in method	C1	Explanation of error eg she should have multiplied 348 by 2 not divided									
10 (a)		Jake with reason	C1	Explanation referring to spread eg range or Jakes figures are closer together or highest and lowest values for both.									
(b)		Reason	C1	Reason eg stem not used or it should be 26									
11 (a)	$30 \div 8$	4	P1 A1	for $30 \div 8$ or 3.75 or 3 or counting up 8s towards 30 to at least 3 lots of 8 or $4 \times 8 (=32)$ oe cao									
(b)		No with reason	C1	No with $32 \div 8$ or ft from (a)									
12 (a)	<table><tr><td>12</td><td>7</td><td>19</td></tr><tr><td>18</td><td>8</td><td>26</td></tr><tr><td>30</td><td>15</td><td>45</td></tr></table>	12	7	19	18	8	26	30	15	45	Correct table	B3 (B2) (B1)	Fully correct table for 5, 6, 7 or 8 figures correct for given values entered correctly in the table or for a correct row or column)
12	7	19											
18	8	26											
30	15	45											
(b)		$\frac{8}{45}$	B1	for $\frac{8}{45}$ or ft from values in table eg $\frac{8}{45}$									

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
15 (a)	16	C1	starts to interpret information eg 75 or 29 in the correct place	May be seen as numerators of fractions for the first 2 marks.
	45 29			
	75 14	C1	for $120 - 75 (= 45)$ and $"45" - 29 (= 16)$	Could be seen in working or on the diagram
	61	C1	Complete and correct frequency tree	
(b)	$\frac{29}{120}$	B1	for $\frac{29}{120}$ or ft "29" from part (a)	Accept any equivalent fraction, decimal form 0.24(166...) or percentage form 24(.166..) Ignore subsequent incorrect attempts to write the correct answer in a different form.
16 (a)	45	B1	cao	
(b)	50	M1	for an attempt to find the gradient eg $"25" \div "0.5"$ ft their readings from the travel graph; use of speed-time formula eg $25 \div 30$ (ignore units if shown)	could be shown in working or on the graph using any acceptable triangle; could be shown by multiples of 25, 0.5 or multiples of ft figures
		A1	cao	
17	18	P1	for process to solve $x - 1 = 2$, eg. $x = 2 + 1 (= 3)$ or for $2x = 6$	Can award mark for $3 - 1 = 2$
		P1	for 2×9	
		A1	cao	



Paper: 1MA1/2F																												
Question	Answer	Mark	Mark scheme	Additional guidance																								
14	6.95 or (2kg flour $\Rightarrow$) 2.70 and (5 kg sugar $\Rightarrow$) 4.25	P1	for process to find the cost of 1kg of flour, eg $4.05 \div 3 (= 1.35)$	May be implied by (2 kg $\Rightarrow$) 2.70																								
		P1	for process to work with cost of sugar, eg $11.85 - 5 \times "1.35" (= 5.10)$	May be implied by (1 kg $\Rightarrow$) 0.85 oe																								
		P1	for process to find cost for 5kg of sugar, eg $"5.10" \div 6 \times 5 (= 4.25)$																									
		A1	for 6.95 or (2kg flour $\Rightarrow$) 2.70 and (5 kg sugar $\Rightarrow$) 4.25																									
15	60.48	P1	for a beginning process, eg $72 \div 100 \times 120 (= 86.4)$ OR $72 \div 100 \times 30 \div 100 (= 0.216)$	[86.4] must be a value less than 120																								
		P1	for process to use both percentages, eg $[86.4] - ([86.4] \times 30 \div 100)$ or $[86.4] \times ((100 - 30) \div 100)$ or $[86.4] \times 30 \div 100 (= 25.92)$ OR $72 \div 100 \times ((100 - 30) \div 100) (= 0.504)$ OR $120 \times "0.216" (= 25.92)$																									
		A1	cao																									
16	24	P1	for finding the total for adults, eg $160 - 85 (= 75)$ or for finding adult romance, eg $33 - 19 (= 14)$ or for finding children adventure, eg $76 - 34 (= 42)$	<table><tr><td></td><td>R</td><td>A</td><td>H</td><td>T</td><td>Tot</td></tr><tr><td>C</td><td>19</td><td>42</td><td>4</td><td>20</td><td>85</td></tr><tr><td>A</td><td>14</td><td>34</td><td>20</td><td>7</td><td>75</td></tr><tr><td>Tot</td><td>33</td><td>76</td><td>24</td><td>27</td><td>160</td></tr></table>		R	A	H	T	Tot	C	19	42	4	20	85	A	14	34	20	7	75	Tot	33	76	24	27	160
			R	A	H	T	Tot																					
		C	19	42	4	20	85																					
		A	14	34	20	7	75																					
Tot	33	76	24	27	160																							
P1	for finding adult horror, eg $"75" - 34 - "14" - 7 (= 20)$																											
P1	for a process to find the number of children who chose horror, eg $85 - 19 - "42" - "20" (= 4)$ or for a complete process to find total horror, eg $(85 - 19 - "42" - "20") + "20"$ or $160 - 33 - 76 - ("20" + 7)$																											
A1	cao	A correct answer unsupported will score 1 mark only																										



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
17 (a)	37, 83 21, 16, 44, 39	B3	for a fully correct frequency tree	If probabilities used instead of frequencies then maximum of B2 can be awarded
		(B2	for at least 4 correct values in the frequency tree)	
		(B1	for at least 1 correct value in the frequency tree)	
(b)	$\frac{83}{120}$	B1	for $\frac{83}{120}$ oe or ft from frequency tree	Accept equivalent fraction or decimal or percentage forms of probability eg 0.69(...) or 69(...)%

Paper: 1MA1/2F				
Question	Working	Answer	Mark	Notes
11		5 : 2 : 10	P1 P1 A1	for process to calculate total for quiz or total of membership fees eg. $13 \times 5 + 35$ (=100), 25×20 (=500) for complete process to write (correct) figures as a ratio, eg 250 : 100 : 500 oe in any order (condone inclusion of units or words) cao
12 (a)		23, 177 10, 13, 85, 92	C3 (C2 (C1	Completes all information correctly. 3 or 4 correct frequencies or all correct probabilities) 2 correct frequencies)
(b)		$\frac{13}{23}$	M1 A1	ft oe for $\frac{a}{23}$, $a < 23$ or $\frac{13}{b}$, $b > 13$ ft oe from (a)



Paper: IMA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
15 (a)	420	P1	starts process, eg $300 \div 5 (= 60)$ or $200 \div 2 (= 100)$ OR builds up ratio to at least 300 ml orange juice with one error	May be seen as $"60" \times 7$ "60" must come from correct method
		P1	complete process, eg $"60" \times 5 + "60" \times 2$ or $300 : 120$	
		A1	cao	
		C1	explains that it will have no effect with reason, eg because he only needs 120 ml of lemonade because he has no more orange juice to use	
(b)	explanation	C1	explains that it will have no effect with reason, eg because he only needs 120 ml of lemonade because he has no more orange juice to use	
16	No and explanation	C1	'No' and explanation with reference to multiplication or division eg No he's incorrect as you would multiply the sides by a number rather than add	
17 (a)	32, 48, 24, 8, 37, 11	C1	starts to interpret information, eg 48 or 8 in correct place	Incorrect notation with "37" and "61" can earn the method mark but not the accuracy mark. Accept any equivalent fraction, decimal form 0.60(65...) or 0.61 or percentage form 60(.65...) % or 60% or 61%
		C1	for $80 - 48 (= 32)$ and $"32" - 8 (= 24)$	
		C1	completes frequency tree correctly SC: award C2 if all correct frequencies are shown as fractions of 80.	
		M1	ft for $\frac{a}{"61"}$ with $a < "61"$ or $\frac{"37"}{b}$ with $b > "37"$	
		A1	ft from diagram in (a)	
(b)	$\frac{37}{61}$	M1	ft for $\frac{a}{"61"}$ with $a < "61"$ or $\frac{"37"}{b}$ with $b > "37"$	
		A1	ft from diagram in (a)	

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
17	7 22 15 38 29 9	C1 M1 M1 M1 A1	for correctly placing one of the given values in the diagram eg 38 women or 15 men email for 60 – 38 (=22) or 22 (men) correctly placed in the diagram or 60 – 38 – 15 (=7) or 7 (men texting) correctly placed in the diagram for a method to find 60% of 60, eg. 60×0.6 (= 36) for calculating with 60% of 60 eg “36” – (“22” – 15) (= 29) or “36” – “7” (=29) or (60 – “36”) – 15 (= 9) for a fully correct frequency diagram	May be implied by the total number of texts in the frequency diagram being 36 9 or 29 on the diagram (women branch) gets the two M marks for finding and calculating with 60% of 60 If probabilities used instead of frequencies then maximum of C1M1M1M1A0 can be awarded
18	13	P1 P1 A1	for at least two of 3×5 (=15) or 2.5×8 (=20) or 1.5×14 (=21) or 1×10 (=10) or for $3 \times 5 + 2.5 \times 8 + 1.5 \times 14 + 1 \times 10$ (=66) for process to find length of all 2m planks, eg. $92 - (3 \times 5 + 2.5 \times 8 + 1.5 \times 14 + 1 \times 10)$ (= 26) or $92 - “15” - “20” - “21” - “10”$ (= 26) cao	Note 66 on its own will score this mark If no calculations are seen for products allow one error in “15”, “20”, “21”, “10” 13 in the correct place in the table should be accepted as the final answer
19	No (supported)	P1 P1 P1 C1	for a process to find Rachel’s share, eg. $600 \div 5 \times 2$ (= 240) for process to find Samina’s share eg. $(600 - “240”) \div 4$ (= 90) for a process to find either of Tom’s share, eg. $600 - “240” - “90”$ (= 270) or $3 \times “90”$ (=270) or $600 \div 3$ (= 200) for comparison purposes for “No” and accurate figures eg. 270 and 200 or 270 and 70 (difference)	Note This mark, if awarded for 200, may be the only mark awarded “No” may be implied by a statement Answer only with no working, no marks

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
17 (a)	Frequency diagram See end of m/s	C3 (C2) (C1)	for a fully correct frequency diagram for at least 5 correct values in the frequency diagram) for at least 3 correct values in the frequency diagram)	If probabilities used instead of frequencies then maximum of C2 can be awarded
(b)	$\frac{12}{72}$	M1 A1	for $\frac{a}{72}$ where $0 < a < 72$ and a is an integer or $\frac{12}{b}$ where $b > 12$ and b is an integer or $12 : 72$ or ft their values for 72 and/or 12 from (a) for $\frac{12}{72}$ oe or ft (a)	Accept equivalent decimal or percentage forms of probability Ignore errors in cancelling of their $\frac{12}{72}$
18	100	M1 A1	M1 for a correct first step, eg $25 \div 10 (= 2.5)$ or $40 \div 10 (= 4)$ or 20 (scones) = $40 \times 2 (= 80g)$ or 5 (scones) = $40 \div 2 (= 20g)$ cao	Multiplier may be seen as evidence of this mark
19	288	M1 M1 A1	for a method to find 20% eg $240 \times 20 \div 100 (= 48)$ or shows a multiplier of 1.2 oe or 120% M1 for a complete method eg $240 + "48"$ or 240×1.2 oe or $240 \times 120 \div 100$ cao	

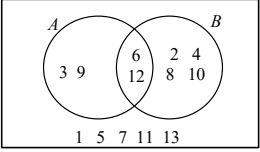


Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
12	10 55	M1 A1	for starting a process of working with time eg for undertaking some time conversion eg 1 h = 60 min eg 3¼ hrs is 195 mins or ¼ hr = 15 mins or 3 h = 180 min or for an answer of 10 45 (am) or 10 40 (am) or 10 50 (am) or for an answer of 10 55 pm for 10 55 (am)	
13 (a)	$20h^3$	B1	cao	
(b)	$7y$	B1	cao	
14	$\frac{6}{11}$, 0.558, 0.56, 57%, $\frac{7}{12}$	M1 A1	Converts numbers to common equivalent form, eg 0.58(33..), (0.56), 0.57(0), 0.54(54..), (0.558) or any 4 in correct order or all 5 in correct reverse order for correctly ordered list	Decimals converted to at least 2 d.p. May be given in converted format.
15 (a)	$\frac{57}{64}$ $\frac{7}{25}$ $\frac{11}{11}$	B3 (B2) (B1)	for a fully correct frequency tree for at least 4 figures correctly placed) for at least 1 figure correctly placed)	If probabilities used instead of frequencies award a maximum of B2
(b)	$\frac{57}{64}$	M1 A1	$\frac{a}{64}$ where $0 < a < 64$ and a is an integer (ft) or $\frac{57}{b}$ where $b > 57$ and b is an integer (ft) (ft) for $\frac{57}{64}$ oc	Must be values from their diagram with numerator < denominator Accept probabilities given as equivalent fractions, 0.89(06...) or 89(.06..) %

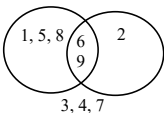
Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
11 (a)	110 70 100 280 90 80 50 220 200 150 150 500	C3 (C2 (C1	for a fully correct table for 6 or 7 or 8 or 9 or 10 correct entries) for 3 or 4 or 5 correct entries)	
(b)	$\frac{100}{500}$	M1 A1	for $\frac{a}{500}$ where $0 < a < 500$ or for $\frac{100}{b}$ where $100 < b \leq 500$ or ft their table for $\frac{100}{500}$ oe or ft their table	100:500 scores M1A0 For M1 ft their table this is for $\frac{\text{their value of adult action from table}}{c}$ where their value of action adult $< c \leq 500$ For A1 ft their table is for $\frac{\text{their value of adult action from table}}{500}$
12	explanation	C1	for explanation Acceptable examples he should have multiplied first multiplication should be done before subtraction he should have done 3×4 first he didn't use BIDMAS/BODMAS/PEMDAS $5 - 12 = -7$ Not acceptable examples he was correct the answer is -7 Olly's method gives the wrong answer BIDMAS/BODMAS/PEMDAS he should multiply first so $3 \times 4 = 12$ then $12 - 5 = 7$ he should have done $3 \times 4 = 12$ then $12 - 5 = 7$ he should have done 2×4 first	

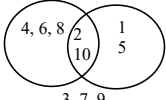
Paper: 1MA1/1F				
Question		Answer	Mark	Mark scheme
23	(a)	10, 11, 13, 14, 16, 17	B1	cao
	(b)	$\frac{5}{9}$	M1	for identification of 10, 12, 14, 15, 18 or for $\frac{a}{9}$ where $1 \leq a \leq 8$, a an integer, or $\frac{5}{b}$ where $b > 5$, b an integer or for incorrect form, eg 5 : 9
			A1	oe
				Accept any equivalent fraction, decimal form, 0.55(5...) or 0.56 or percentage form, 55(.5...) % or 56%



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
19	17	M1 A1	for correctly expanding the bracket, as part of an equation to get $4x - 24 = 44$ or for dividing both sides of the equation by 4 as a first step, eg $\frac{4(x-6)}{4} = \frac{44}{4}$ oe cao	Award M1 for an embedded value of 17 if not identified as the answer
20	Venn Diagram	B1 M1 M1 A1	for labelling diagram, accept “multiples of 3” and “even numbers” for labels for correct numbers in at least one region for correct numbers in at least two regions for all regions correct	Ignore all entries except the region you are marking for each method mark 
21	8	M1 M1 A1	for $158220 - 146500 (=11720)$ or $158220 \div 146500 (=1.08)$ for complete method, eg $(158220 - 146500) \div 146500 \times 100$ oe or $1.08 \times 100 - 100$ cao	0.08 as an answer implies M1

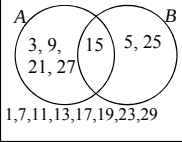


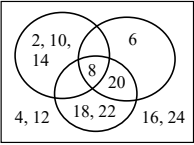
Paper: IMA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
24 (a)	6,9	M1	for 6, 9 in the intersection only	Ignore all entries except the region you are marking for each method mark 
	1,5,8	M1	for 1, 5, 8 in set A only	
	2		or 2 in set B only	
	3, 4, 7	C1	or 3, 4, 7 in set $(A \cup B)'$ only	
		C1	for all numbers correctly placed in the Venn Diagram	
(b)	$\frac{2}{9}$	M1	ft for identification of 2 or 9 or ft diagram	Need not be written in correct form at this stage eg could be a ratio 2 : 9 Repeated digits in the diagram should be counted as 2 elements Accept any equivalent fraction, decimal form 0.22(22...) or percentage form 22(22...) %
		A1	$\frac{2}{9}$ oe or ft diagram	
25	12272.70 12272.71 or 12272.72	M1	for evidence of using a correct first step eg 200000×0.015 (= 3000) or 200000×1.015 (= 203000)	values may be rounded or truncated to 2 dp
		M1	for evidence of a compound interest method eg 203000×0.015 (= 3045) or 203000×1.015 (= 206045) or 206045×0.015 (= 3090.675) or 206045×1.015 (= 209135.675) or 209135.675×0.015 (= 3137.035...) or 209135.675×1.015 (212272.710...) or 200000×1.015^t , $t \geq 2$	
		A1	for 12272.7(0) or 12272.71 or 12272.72	
			SC B2 for 212272.7(0) or 212272.71 or 212272.72	

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
22 (a)	Venn diagram	M1	for correct numbers in at least one region	Ignore all entries except the region you are marking for each method mark 
		M1	for correct numbers in at least two regions	
		A1	for all regions correct	
	$\frac{2}{10}$	M1	for $\frac{a}{10}$ where $0 < a < 10$ and a is an integer or $\frac{2}{b}$ where $b > 2$ and b is an integer or ft diagram	
		A1	$\frac{2}{10}$ oe or ft diagram	
23	No (supported)	P1	for $3000 \div (2 + 3) (= 600)$	Full method to compare No may be implied by a statement No working, answer only no marks
		P1	for “600” $\times 2 (= 1200)$ or “600” $\times 3 (= 1800)$ or “600” $\div 6 (= 100)$ or “600” $\div 20 (= 30)$	
		P1	for “1200” $\div 6 (= 200)$ or “1800” $\div 20 (= 90)$ or “100” $\times 2 (= 200)$ or “30” $\times 3 (= 90)$	
		P1	for “90” $\div$ (“200” + “90”) $\times 100 (= 31.0\dots)$ oe or “90” $\div$ (“200” + “90”) $(= 0.31\dots)$ or $0.3 \times$ (“200” + “90”) $(= 87)$ oe	
		C1	correct conclusion and fully correct calculations with accurate figure eg No and 87 or No and 31% or No and 0.31	

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
23	Frequency polygon drawn	B2	for fully correct frequency polygon with points plotted at the midpoints	Joining must be with line segments Accept points plotted within half a small square Ignore any histogram drawn and any part of a frequency polygon outside range of first and last points plotted
	(2.5, 8), (7.5, 24) (12.5, 13) (17.5, 11) (22.5, 4)	(B1)	for all points plotted correctly but not joined with line segments or points plotted at correct heights not at midpoints but consistently within each interval and joined with line segments or correct frequency polygon with one point incorrect or correct frequency polygon with first and last points joined directly)	for example, at 0, 5, 10,...or at 5, 10, 15,...
24 (a)	Venn diagram	B3	for a fully correct Venn diagram	Ignore all entries except the region you are marking for each method mark
		(B2)	for two or three of the four regions correct)	
		(B1)	for just one of the four regions correct)	
(b)	$\frac{7}{10}$	M1	(ft diagram) for $\frac{a}{10}$ where $0 < a < 10$ and a is an integer or $\frac{7}{b}$ where $b > 7$ and b is an integer or $1 - \frac{3}{10}$ or $7 : 10$	Repeated digits in the diagram should be counted as 2 elements
		A1	(ft diagram) for $\frac{7}{10}$ or	Accept any equivalent fraction, or 0.7 or 70%



Paper: 1MA1/3F				
Question	Working	Answer	Mark	Notes
15 (a)		Venn Diagram	B1 M1 M1 C1	for labels on diagram for just 15 in the intersection for just 5 and 25 in only set B or just 3, 9, 21 and 27 in only set A or just 1, 7, 11, 13, 17, 19, 23, 29 in $(A \cup B)'$ for all numbers correctly placed in the Venn Diagram Ignore all entries except the region you are marking for each method mark
(b)		$\frac{7}{15}$	P1 A1	ft for $\frac{7}{a}$ where $a \geq 7$ or $\frac{b}{15}$ where $b \leq 15$ oe
16		$x = -\frac{2}{3}$ $y = -2$	M1 M1 A1	for a method to eliminate one variable (condone one arithmetic error) (dep) for substituting found value in one of the equations or appropriate method after starting again (condone one arithmetic error) $x = -\frac{2}{3}$ oe and $y = -2$
17 (a)		12	B1	cao
(b)		Explanation	C1	No with statement about not being mutually exclusive events eg a person could be in both categories

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
20 (a)	Venn diagram	C4	fully correct Venn diagram	 Need not be written as a fraction or probability at this stage. eg could be a ratio 1:12 Acceptable equivalents are (eg, could fit) any fraction equivalent to $\frac{1}{12}$, 0.08(33..) or 8(.33..)%
		(C3	7 of the 8 regions correct or for a diagram with only one number incorrectly placed)	
		(C2	5 or 6 of the 8 regions correct)	
		(C1	3 or 4 of the 8 regions correct)	
	(b)			
21	statements	M1	fit for identification of 1 or 12 eg from the diagram	
		A1	fit oe	
		C1	for lobf incorrect	
			Acceptable examples lobf lobf does not suit all points/not a lobf lobf wrong since hits x axis/is inaccurate/should be amongst the crosses lobf goes through the origin/through one point Not acceptable examples no correlation/there is no title	
		C1	for height scale not linear	
			Acceptable examples 150 missing Height not linear / Height numbers going up wrong Not acceptable examples 150 graph does not start at 140/graph does not start at 0 height should start at 170	

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
22	Probabilities should sum to 1	C1	for stating that the probabilities should total 1 eg 0.25 should be 0.35	Can be shown on the diagram
	0.35 and 0.65 reversed	C1	for recognising that the 0.35 and 0.65 in the first branches for the 2nd throw should be reversed eg, “for the second throw, the probability it lands on 4 should be 0.65”	
23 (a)	50.5	M1 A1	for $\cos ABC = \frac{7}{11}$ (0.63...) oe for answer in the range 50.4 to 50.51	Must be a complete statement for cos, sin or tan with all three elements present. If an answer is in the range 50.4 to 50.51 is given in the working space then incorrectly rounded, award full marks.
(b)	Increase (supported)	C1	States increase with supporting reason eg “ $\frac{7}{10}$ is greater than $\frac{7}{11}$ ” “0.636 is less than 0.7”“cos increases as angle decreases” “decreasing the denominator increases the value of the fraction” “angle is now 45.6” (accept 45.5 – 45.6)	If figures are given they must be correct (truncated or rounded).

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
29	16	M1 A1	for simplifying using a correct rule of indices as a first step eg 4^{9-6} (= 4^3 oe) or 4^{-6-1} (= 4^{-7} oe) or 4^{9-1} (= 4^8 oe) or $\frac{4 \times 4 \times 4 \times 4 \times 4 \times 4 \times 4 \times 4 \times 4}{4 \times 4 \times 4 \times 4 \times 4 \times 4 \times 4 \times 4}$ or 4^2 cao	
30	$\frac{1}{2}$	B1	for $\frac{1}{2}$ oe	
31	0.06	M1 A1	for 0.2×0.3 oe 0.06 oe	Accept any equivalent fraction or 6%



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
15	3.5	M1 M1 A1	for a correct first step, eg $14 \times 25\,000 (= 350\,000)$ or digits $14 \times$ digits 25 or $25\,000 \div 100\,000 (= 0.25)$ oe or $14 \div 100\,000 (= 0.00014)$ or [distance] $\div 100\,000$ for a complete method, eg “ $350\,000$ ” $\div 100\,000$ oe or “ 0.25 ” $\times 14$ or “ 0.00014 ” $\times 25\,000$ for 3.5 oe	[distance] is any calculated value using digits 14 and digits 25
16	Box B and correct figures	P1 P1 C1	for process to find one probability or proportion, eg $\frac{10}{10+30} \left(= \frac{10}{40} \right)$ or $\frac{7}{7+18} \left(= \frac{7}{25} \right)$ (dep P1) for process to find figures to compare using a common format, eg $10 \div [40] (= 0.25)$ and $7 \div [25] (= 0.28)$ or $10 \div [40] \times 100 (= 25)$ and $7 \div [25] \times 100 (= 28)$ or $\frac{10}{[40]} = \frac{25}{100}$ oe and $\frac{7}{[25]} = \frac{28}{100}$ oe or $\frac{10 \div 10}{[40] \div 10} \left(= \frac{1}{4} \right)$ and $\frac{7 \div 7}{[25] \div 7} \left(= \frac{1}{3.57\dots} \right)$ (dep on P2) for Box B and correct comparative figures, eg 0.25 and 0.28 or 25% and 28%	Accept 10 : 30 or 7 : 18 Accept eg 30 : 90 and 35 : 90 [40] is any value >10 [25] is any value >7 but one probability or proportion must be correct from previous P1 Comparative figures may be probabilities, ratios or comparative proportions eg box A: 70R and 210G and box B: 70R and 180G



Paper: IMA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
25	$x = 4.5, y = -1.5$	M1	correct process to eliminate one variable (condone one arithmetic error)	Fractions do not need to be in simplest form
		M1	(dep) for substituting found value in one of the equations OR correct process after starting again (condone one arithmetic error)	
		A1	for $x = 4.5, y = -1.5$ oe	
26	shown	C1	for method to find area of semicircle, eg $\pi \times 10^2 \div 2 (= 50\pi)$	Can award first 3 marks if a value for π is used Working out to find the area of the shaded region must be shown
		C1	for method to find area of quarter circle, for $\pi \times 20^2 \div 4 (= 100\pi)$	
		C1	for a complete method to find area shaded and area of square, eg $\pi \times 20^2 \div 4 - \pi \times 10^2 \div 2$ and 20×20	
		C1	fully correct working leading to $\frac{\pi}{8}$	
27	(a)	B2	for all probabilities correct (oe)	Accept any equivalent fraction, decimal form 0.16(6...) or 0.17 or percentage form 16(.6...) % or 17%
		(B1	for 2 or 3 correct)	
	(b)	M1	for $\frac{3}{10} \times \frac{5}{9}$ oe	
		A1	$\frac{15}{90}$ oe	

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
27 (a)	$\frac{1}{3}, \frac{2}{3}, \frac{1}{3}, \frac{2}{3}, \frac{1}{3}, \frac{2}{3}$	B2	six fully correct probabilities	Accept any equivalent fraction, decimal form 0.33(3...) and 0.66(6...) or 0.67 or percentage form 33(.3...)%, and 66(.6...)%, or 67%
		(B1	at least 2 correct probabilities)	
		M1	for $\frac{1}{3} \times \frac{2}{3}$ oe or ft probabilities from diagram	
(b)	$\frac{2}{9}$	A1	for $\frac{2}{9}$ oe	Accept any equivalent fraction, decimal form 0.22(2...) or percentage form 22(.2...)%
28 (a)	-2, 4	B1	cao	If answers are stated as coordinates, award M1 for both coordinates and M0 for one coordinate. With no extras
		M1	for correct method, eg marking intercepts with x-axis or one correct answer or both solutions given as a coordinate eg (0.6, 3.4) or (0.6, 0) (3.4, 0)	
		A1	for answers in the ranges 0.55 to 0.65 and 3.35 to 3.45	
29	96	M1	for a complete process to find the volume eg $6 \times 4 \times 10 \div 2$ (= 120)	
		M1	for a complete process, eg $(6 \times 4 \times 10 \div 2) \times 0.8$	
		A1	cao SC B1 for 192	

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
20 (a)	0.87, 0.94, 0.94	B2	for all probabilities correct	Accept any equivalent fraction, eg $\frac{87}{100}, \frac{47}{50}$ or equivalent percentage form 87%, 94%
		(B1	for 0.87 or 0.94 correctly placed)	
		M1	for 0.13×0.06 oe	
		A1	0.0078 oe	
21 (a)	x^{15}	B1	cao	Accept any equivalent fraction, eg $\frac{39}{5000}$ or equivalent percentage form 0.78% or 7.8×10^{-3}
		M1	for method to expand one bracket or collect like terms, eg $4 \times x + 4 \times 3 (= 4x + 12)$ or $7 \times 4 - 7 \times 2x (= 28 - 14x)$ or $4 \times x - 7 \times 2x (= 4x - 14x)$ and $4 \times 3 + 7 \times 4 (= 12 + 28)$	
		A1	oe	
		M1	for $3(5x^3 + x^2y)$ or $x(15x^2 + 3xy)$ or $3x(5x^2 + xy)$ or $x^2(15x + 3y)$ or $3x^2(ax + by)$	
22	translation $\begin{pmatrix} -5 \\ 6 \end{pmatrix}$	B1	for translation	Award no marks if more than one transformation is given Do not accept as a coordinate $(-5, 6)$
		B1	for vector $\begin{pmatrix} -5 \\ 6 \end{pmatrix}$	

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
26 (a)	0.7	B1	for 0.7 on the first branch	Accept equivalent fractions or percentages for probabilities
	0.65, 0.65	B1	for 0.65, 0.65 on the second branches	
	(b) 0.105	M1	for 0.3×0.35	
		A1	oe	
27 (a)	0.008	B1	for 0.008 or 8×10^{-3}	May be awarded at any stage
	(b) 50	M1	for conversion from km to m eg $180 \times 1000 (= 180\,000)$ or for conversion from hours to seconds eg $180 \div (60 \times 60) (= 0.05)$ or for conversion from km per hour to metres per second, eg $1000 \div (60 \times 60) (= 0.277\dots)$ (Accept $(60 \times 60) \div 1000 (= 3.6)$)	
		M1	for a complete process eg $180 \times 1000 \div 3600$	
		A1	cao	
28	158	P1	for a first step in the process eg $50 \times 167.6 (=8380)$ or $20 \times 182 (=3640)$	
		P1	for a complete process eg $(50 \times 167.6 - 20 \times 182) \div 30$ or $\frac{8380 - 3640}{30}$ or $4740 \div 30$	
		A1	cao	

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
27 (a)	0.4	B1	for 0.4 in correct position	Accept equivalent fractions or percentages for probabilities An answer of $\frac{0.33}{1}$ scores M1A0
	0.45, 0.55, 0.45	B1	for the correct probabilities for coin B in the correct place on the branches	
	0.33	M1	for a correct method, eg 0.6×0.55 only	
		A1	for 0.33 oe	
28	63	P1	for process to find volume, eg $\pi \times 100^2 \times 30$ ($= 300\,000\pi$ or $942\,477(.796\dots)$)	(volume $\Rightarrow$) $942\,478$ implies P1
		P1	for process to find time in seconds, eg " $942\,477(.796\dots)$ " $\div$ 250 ($= 1200\pi$ or $3769(.911\dots)$) or [volume] $\div$ 250 or for converting rate to minutes, eg 250×60 ($= 15\,000$)	(time $\Rightarrow$) 3770 implies P2 [volume] $\neq 30, 60, 100, 250$
		P1	for complete process, eg " $3769(.911\dots)$ " $\div$ 60 ($= 20\pi$) or " $942\,477(.796\dots)$ " $\div$ " $15\,000$ " ($= 20\pi$)	
		A1	for answer in the range 62 to 63	A correct answer with no supportive working gets 0 marks If an answer is shown in the range in working and then incorrectly rounded award full marks



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
18 (a)	340 200	B1	cao	
	8.026× 10 ⁻¹	B1	cao	
19	Drawn	B2	for a correct construction with all relevant arcs drawn	
		(B1	for all relevant arcs drawn or for a bisector within guidelines but with no or insufficient arcs)	
20 (a)	(0.3) 0.7 0.3 0.7 0.3 0.7	B2	all probabilities correctly placed	Accept equivalent fractions or percentages for probabilities
		(B1	for 0.7 correctly placed for Game 1)	
		M1	for a correct method, ft their tree diagram eg 0.7 × 0.7 only	ft their diagram provided probabilities are less than 1
(b)	0.49	A1	oe, ft their tree diagram	An answer of $\frac{0.49}{1}$ scores M1A0 unless 0.49 seen