Eduqas GCSE Mathematics Higher Tier

Probability and Statistics Revision Booklet



The questions included in this booklet have been taken from past examination papers used in previous Eduqas examinations.

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Probability

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Statistics

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Please note that any questions labelled as “Calculator” have been taken from an exam paper where the use of a calculator was allowed. This does not necessarily mean that a calculator is required to answer the question.

Expected Outcomes: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	5	
Total	5	

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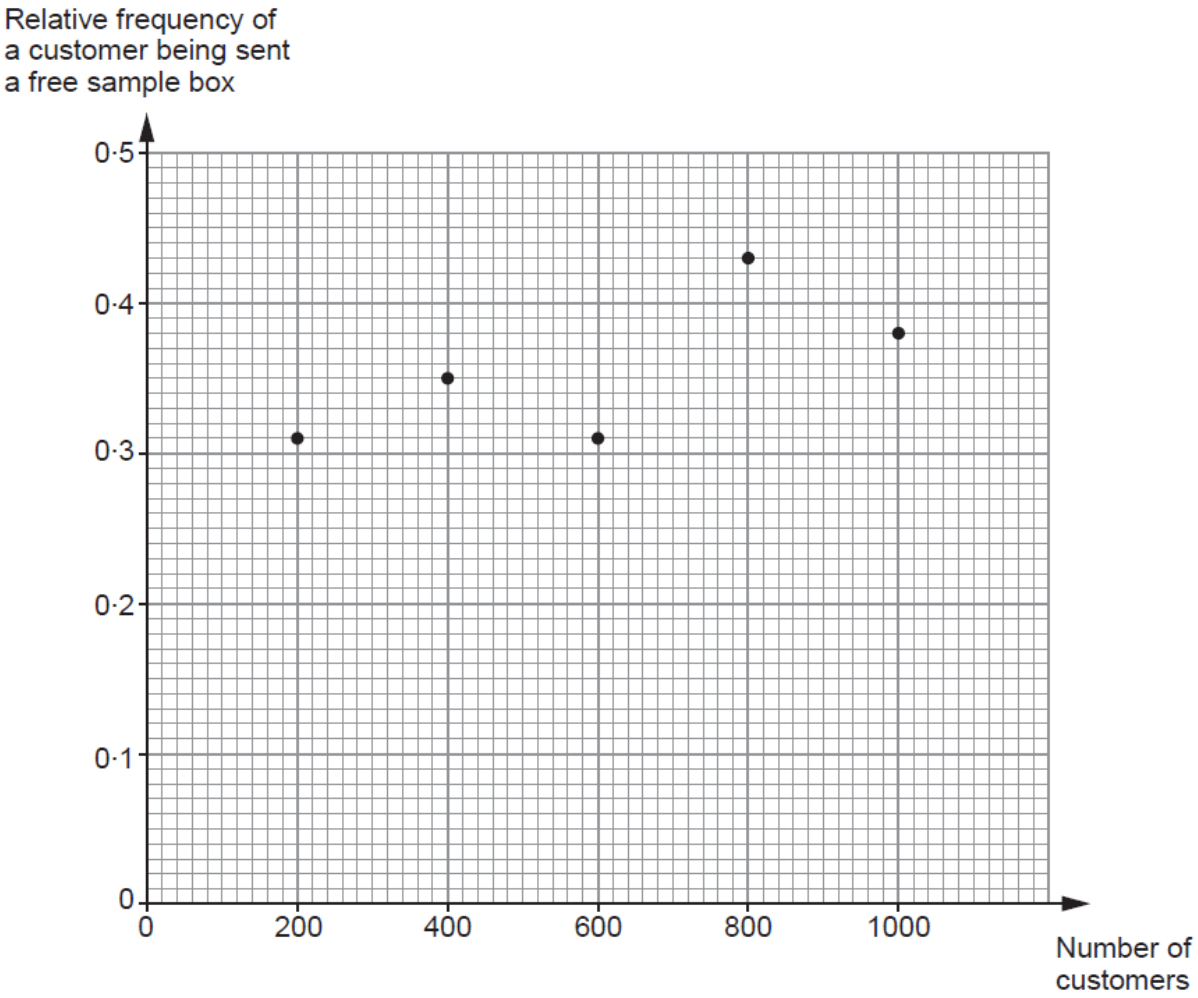
#1

Novak's online chocolate company has a special offer.



Novak records the number of free sample boxes he sends to his customers.

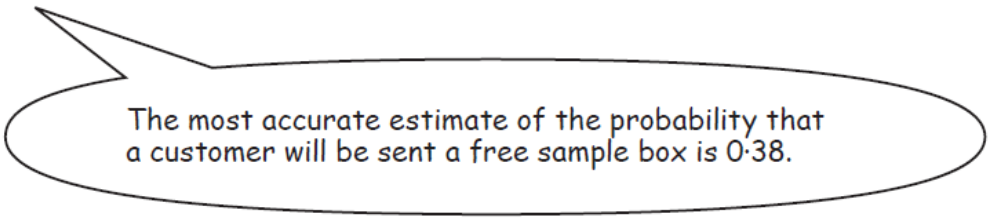
The graph shows the relative frequency that a customer has been sent a free sample box after 200, 400, 600, 800 and 1000 customer orders.



(a) What is the total value of the free sample boxes that Novak sent his first 400 customers? [4]

Total value of free sample boxes is £ .....

(b) Novak says:



Is he correct?

Yes ☐ No ☐

Explain how you decide. [1]

Question taken from Eduqas examination paper 530003, November 2021

Expected Outcomes: Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	3	
#3	4	
#4	5	
Total	15	

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#1

Marcus has the cards shown below.
He places these cards in a bag.

E	X	A	M	I	N	A	T	I	O	N

Marcus selects two of the cards at random from the bag.
The letters are recorded and the two cards are replaced in the bag.
He repeats this process 275 times.

How many times would you expect Marcus to select the two cards with the letter A? [3]

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Question taken from Eduqas examination paper 530004, November 2024

#2

Rashid plays a game.
Each time he can score 1 point, 5 points or 10 points.
The table shows the probability of each outcome.

Points	Probability
1	0·80
5	0·15
10	0·05

Rashid plays the game 40 times.

How many times does he expect to score more than 1 point? [3]

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Question taken from Eduqas examination paper 530004, November 2020

#3

Jenny is setting up a stall offering prizes in a community hall.
She has a bag of white, red, green and black balls.
All the balls in the bag are the same size.

A player pays £1 to select a ball at random.
The probability that a player selects:

- a white ball is 0·4,
- a red ball is 0·2,
- a green ball is 3 times the probability of selecting a black ball.

When either a black ball or a red ball is selected the player will win a prize.
The prizes are:

- £2.50 for selecting a black ball,
- £1.50 for selecting a red ball.

Any ball selected is to be placed back into the bag before the next player has a go.

If 300 players select a ball, show that Jenny can expect to make a profit in excess of £125. [4]

Question taken from Eduqas examination paper 530004, November 2018

#4

Three friends, Jane, Caroline and Eddie, each throw the **same** dice 40 times.
Their results are shown in the table below.

	Score on the dice					
	1	**2**	**3**	**4**	**5**	**6**
Jane	8	4	8	8	4	8
Caroline	8	5	7	7	5	8
Eddie	8	2	9	9	4	8

(a) Do you think this dice is fair?
You must give a reason for your answer. [1]

Yes ☐ No ☐ Don't know ☐

(b) What is the best estimate of the probability of scoring a 2 on this dice? [2]

(c) Using Jane's, Caroline's and Eddie's results, how many times would you expect a score greater than 4 to occur in 480 throws of this dice? [2]

Question taken from Eduqas examination paper 530004, June 2018

Two-Way Tables: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	5	
#2	6	
#3	6	
Total	17	

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#1

A running club has 125 members.
Each member is either a sprinter, a middle-distance runner or a long-distance runner.

82 members are seniors.
45 members are long-distance runners and 5 of these are juniors.
28 members are senior middle-distance runners.
There are 3 more junior sprinters than senior sprinters.

A person is selected at random from the club.

Find the probability that this person is a junior middle-distance runner.
Use this table to help you. [5]

	Sprinter	Middle-distance runner	Long-distance runner	Total
Senior				
Junior				
Total				

Probability .....

Question taken from Eduqas examination paper 530003, November 2021

#2

Lena sold 200 drinks on Saturday.

This table shows some information about these drinks.

	Tea	Coffee	Milkshake	Totals
Small	5			61
Medium			6	
Large		42		
Totals			66	200

On that Saturday:

- 15% of the drinks sold were large teas.
- The ratio of the number of medium teas to the number of medium milkshakes sold was 3:1.
- The number of large milkshakes sold was double the number of small milkshakes sold.

Complete the table above using this information.

One of the drinks is selected at random.
Find the probability that this drink was either a medium tea or a medium coffee. [6]

Probability of selecting a medium tea or a medium coffee = ...

Question taken from Eduqas examination paper 530003, November 2023

#3

A tennis club has 240 members.
They each played a senior, main or junior event in one of three competitions, *A*, *B* or *C*.

Of the club members:

- 110 played in *A*,
- 30 played in a junior event,
- 25 played in the senior event in *B*,
- no junior played in *C*,
- 40 of those who played in *C* were in the main event.

The number of members who played in a senior event was 150% more than those who played in a junior event.
The ratio of members who played in *B* and *C* was $B : C = 6 : 7$.
The probability that a member played in the junior event in *A* was 0·1.

A member is selected at random from the club.

Use the table to help you to find the probability that this member played in a Main event or played in *B* but not both.
You must show all your working. [6]

	Senior	Main	Junior	Totals
A				
B				
C				
Totals				

Probability = ...

Question taken from Eduqas examination paper 530003, November 2020

Two-Way Tables: Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
Total	2	

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#1 Eric is carrying out a survey for a company that makes energy drinks, Pop and Whizz.
He asks 200 randomly selected adults to complete his survey.

(b) In another question, he asks the 200 adults how many bottles of Whizz they buy each month.
The table shows the results for the 200 adults.

		Number of bottles			
		0	1 to 4	5 to 10	more than 10
Age (years)	18 to 25	26	12	6	6
	26 to 35	29	34	41	2
	older than 35	32	11	1	0

Find the probability that an adult chosen at random from these 200

(i) does not buy Whizz, [1]

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.....

(ii) is 26 to 35 years old and buys 5 or more bottles of Whizz each month. [1]

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.....

Question taken from Eduqas examination paper 530004, June 2023

Venn Diagrams: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	5	
#2	6	
#3	6	
Total	17	

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#1 The following probabilities are given for events *A* and *B*.

$$P(A)=0\cdot3, \qquad P(A\cup B)=0\cdot7, \qquad P(A\cap B)=0\cdot1$$

(a) By drawing a Venn diagram, or otherwise, find the value of $P(B)$. [3]

(b) Find $P(A'\cup B')$. [2]

Question taken from Eduqas examination paper 530003, May 2023

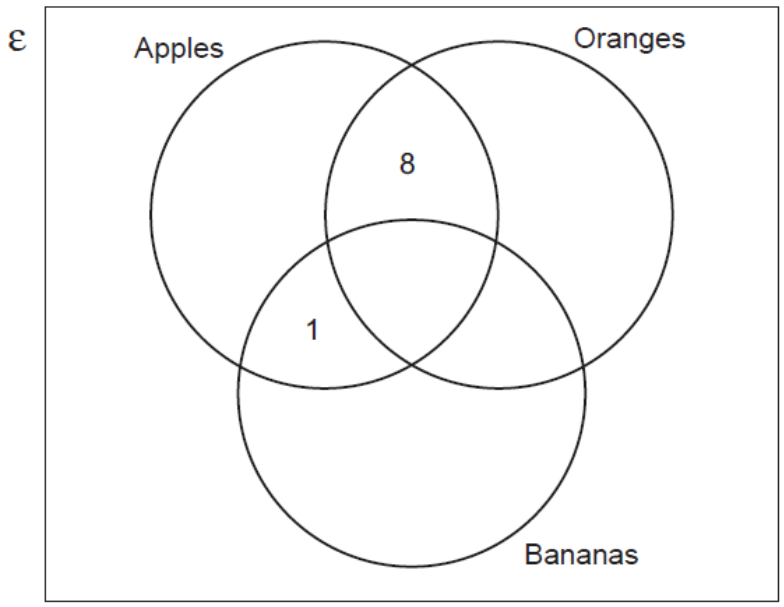
#2

Thirty shoppers were asked which of apples, oranges and bananas, they regularly liked to eat.

Of these 30 shoppers

- 2 liked all three fruits,
- 5 liked oranges but did not like apples or bananas,
- 6 liked both oranges and bananas,
- 17 liked apples,
- 10 liked bananas.

(a) Extra information from the 30 shoppers has been shown in the Venn diagram below.
Complete the Venn diagram using the information given above. [3]



(b) One shopper is chosen at random.
Find the probability that this shopper does not like any of the three fruits. [1]

(c) One shopper is chosen at random from those who like apples.
Find the probability that this shopper does **not** like oranges. [2]

Question taken from Eduqas examination paper 530003, November 2018

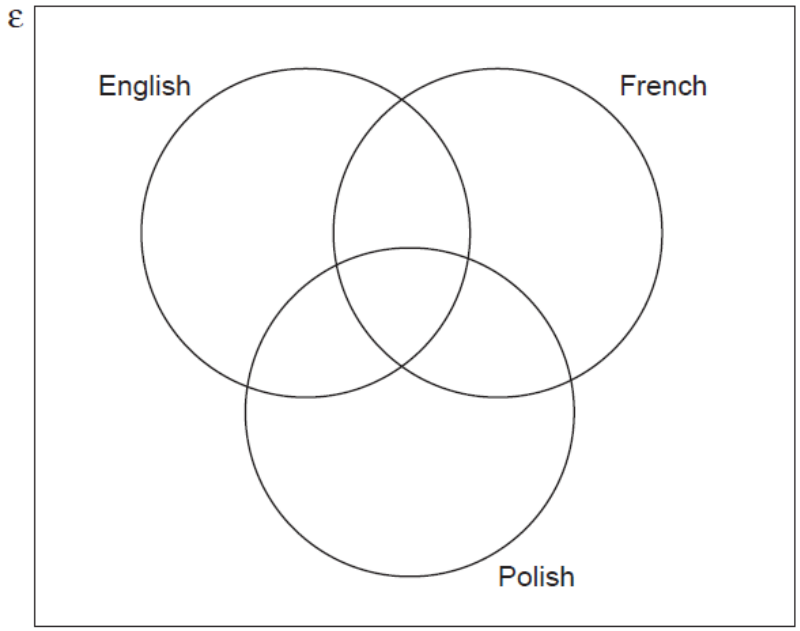
#3

Fifty people were asked which languages they speak from English, French and Polish.

Of these 50 people:

- 8 speak all 3 languages
- 20 speak English only
- 1 speaks French only
- no-one speaks Polish only
- 12 speak English and French but not Polish
- 10 speak French and Polish
- 3 do not speak any of these languages.

(a) Complete the Venn diagram to show this information. [3]
The universal set, Ɛ, contains all 50 people.



(b) One person is chosen at random.
Find the probability that this person does not speak French. [1]

(c) One person is chosen at random from those who speak English.
Find the probability that this person speaks French or Polish but not both. [2]

Question taken from Eduqas examination paper 530003, November 2022

Venn Diagrams: Calculator

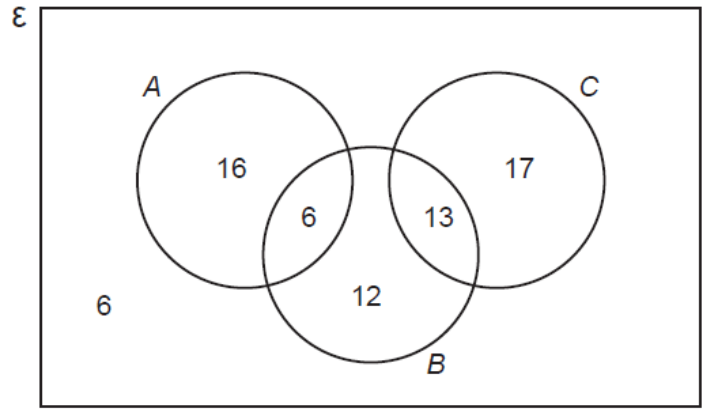
Question	Maximum Mark	Mark Awarded
#1	3	
#2	4	
#3	5	
#4	5	
#5	5	
#6	6	
Total	28	

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#1

At a hotel, 70 guests completed a feedback survey.
The survey had 3 statements, *A*, *B* and *C*.
Guests could tick 0, 1, 2 or all 3 of these statements.

The Venn diagram shows the numbers of the 70 guests who ticked each statement.



(a) One of these guests is chosen at random. Find the probability that this guest ticked statement *A* or statement *C* but not statement *B*. [1]

(b) Given that a guest ticked at least one statement, find the probability that this guest ticked statement *B*. [2]

Question taken from Eduqas examination paper 530004, June 2022

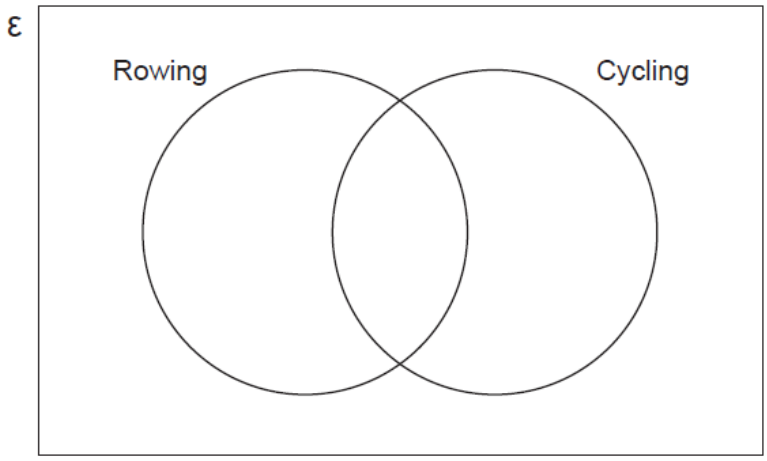
#2

There are 50 people in a sports club.
Two of the sports the people can take part in are rowing and cycling.

Of these 50 people:

- 27 take part in rowing
- 32 take part in cycling
- 8 do not take part in rowing or cycling.

(a) Complete the Venn diagram to show this information. [2]



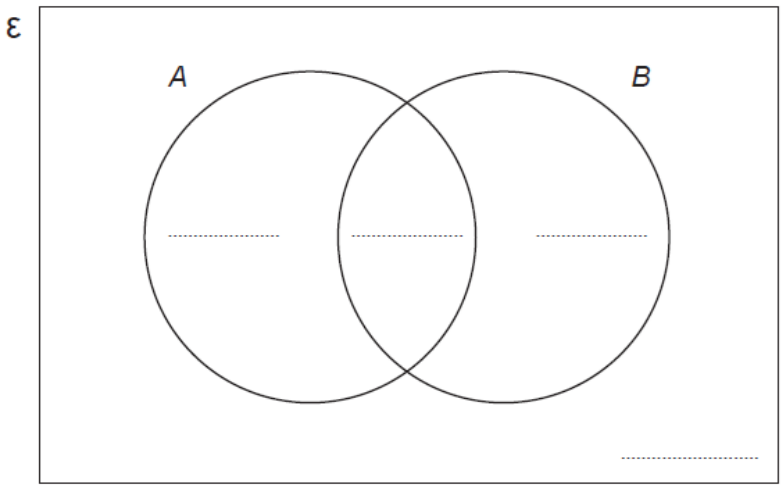
(b) One person is chosen at random from the sports club.
Find the probability that they take part in rowing but not in cycling. [2]

Question taken from Eduqas examination paper 530004, June 2024

#3 For two events, A and B,

$$P(A \cup B) = 0{\cdot}66,\ P(A \cap B) = 0{\cdot}07 \text{ and } P(A \cap B') = 0{\cdot}31$$

(a) By completing the Venn diagram or otherwise, find the probability that B occurs and A does not occur. [3]



The probability that B occurs and A does not occur is .....

(b) Find $P(A \cup B')$. [2]

Question taken from Eduqas examination paper 530004, November 2023

#4

The following probabilities are given for events A and B.

$$P(A) = 0{\cdot}3 \qquad P(B) = 0{\cdot}6 \qquad P(A \cup B) = 0{\cdot}72$$

(a) By drawing a Venn diagram or otherwise, find the probability that A occurs or B occurs but they do not both occur. [3]

(b) Find $P(A' \cap B')$. [2]

Question taken from Eduqas examination paper 530004, November 2021

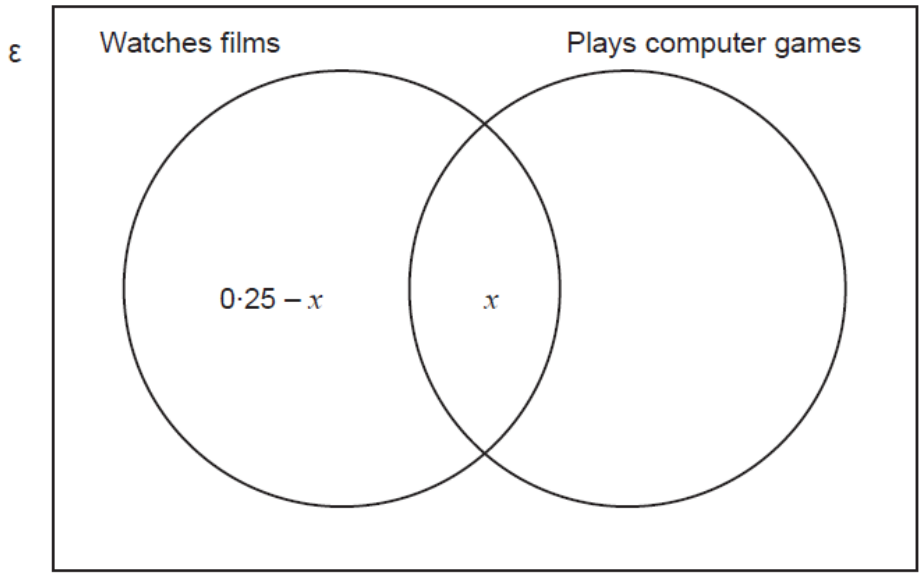
#5

(b) Don sometimes spends his evenings watching films, playing computer games, or doing both.

On any evening the probability that Don:

- watches films is 0·25,
- plays computer games is 0·45,
- does neither is three times the probability that he does both.

(i) Complete the Venn diagram. [1]



(ii) Work out the probability that, on any randomly chosen evening, Don watches films **and** plays computer games. [2]

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(iii) On the evenings Don watches films, what is the probability that he also plays computer games? [2]

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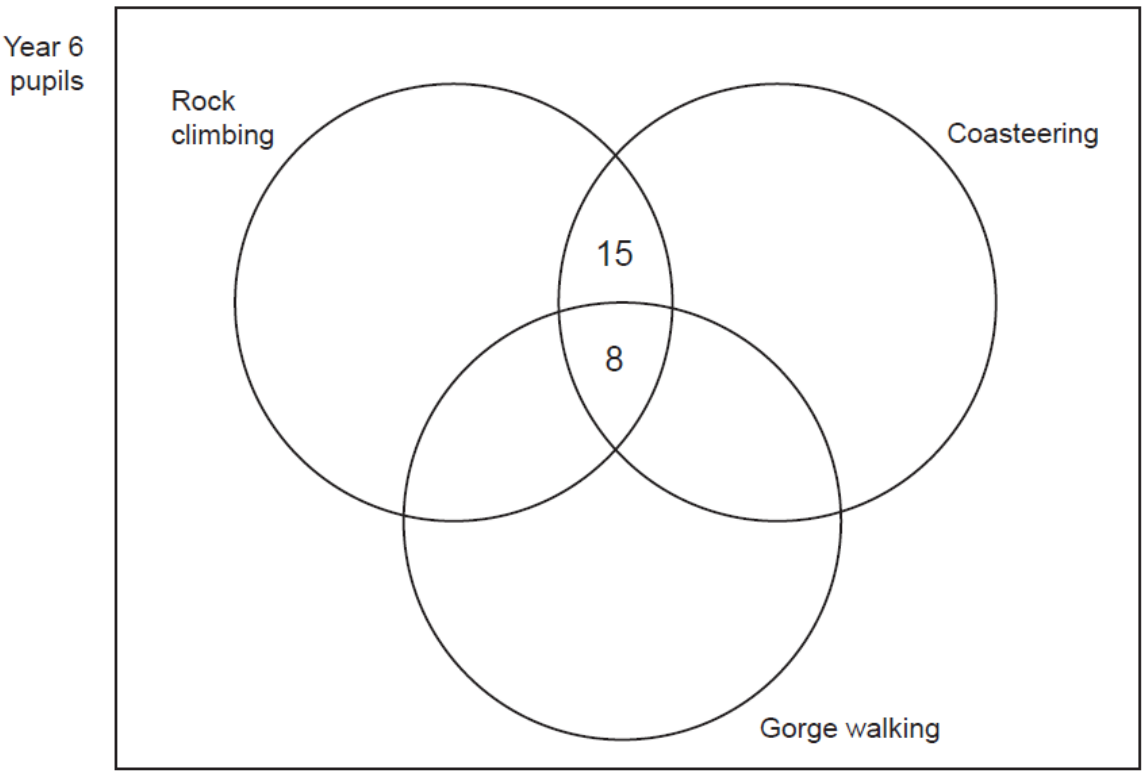
Question taken from Eduqas examination paper 530004, November 2020

#6

There are 143 Year 6 pupils going on a school trip to an adventure centre.
They can choose to take part in up to three activities.

- All the pupils took part in at least one activity.
- 8 pupils took part in all three activities.
- 23 pupils took part in rock climbing and coasteering.
- 29 pupils took part in rock climbing and gorge walking.
- 22 pupils took part in coasteering and gorge walking.
- 65 pupils took part in coasteering.
- 76 pupils took part in rock climbing.

(a) Complete the Venn diagram below to display this information. [3]



(b) A Year 6 pupil is chosen at random.
Find the probability that this pupil takes part in gorge walking and coasteering **only**. [1]

(c) Given that a randomly chosen pupil from Year 6 took part in gorge walking, find the probability they also took part in rock climbing. [2]

Question taken from Eduqas examination paper 530004, November 2024

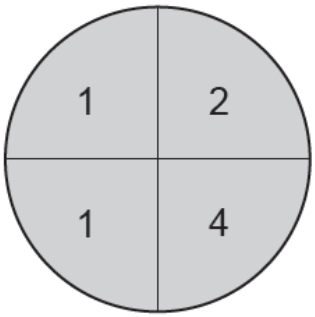
Probability of Independent / Dependent Combined Events: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
#2	2	
#3	3	
#4	4	
#5	4	
#6	6	
#7	7	
Total	28	

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#1

The diagram shows a dartboard with 4 sectors of equal size.





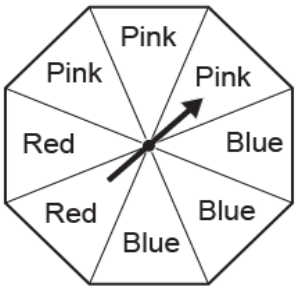
Sanjeev throws 3 darts which all hit this dart board.
Each dart is equally likely to hit any sector of the dart board.

He **multiplies** his three numbers to find his score.

Work out the probability that his score is an odd number. [2]

Question taken from Eduqas examination paper 530003, November 2019

#2



The diagram shows a fair spinner.
Eve spins it twice.

What is the probability that the spinner lands on red both times? [2]

Question taken from Eduqas examination paper 530003, May 2023

#3

A box contains 10 coloured counters.
6 are red,
3 are blue,
1 is pink.

They are identical apart from their colour.

Fran takes a counter at random and keeps it.
Jon takes a counter at random from those that remain.

Find the probability that one of these counters is red and the other is blue. [3]

Question taken from Eduqas examination paper 530003, November 2022

#4

A game of chance at a school fete is played with the following rules.

- There are five identical balls numbered from 1 to 5 in a bag.
- A player takes two balls from the bag at random.
- A player wins a prize when their two balls are numbered 2 and 4.
- At the end of each game, both balls are put back in the bag.

(a) Olivia plays the game once.

What is the probability that she wins a prize? [2]

(b) Alex plays the game and stops playing when he wins.

What is the probability that he only plays the game twice? [2]

Question taken from Eduqas examination paper 530003, May 2022

#5

(a) One Saturday, Alfie records the amount of money each customer spends in a charity shop.
He presents his data in a grouped frequency table, as shown below.

Money spent (£)	Frequency
0 to 20	62
20 to 40	8
40 and over	1

State one criticism of the way Alfie has presented his data. [1]

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.....

(b) The charity has a Fun Day to raise money.

(i) Alfie is in charge of a game of chance.

- A fair spinner is marked with the numbers 1 to 10.
- A player spins once and wins £2 if the spinner lands on 6.

Liam plays the game exactly twice.
Work out the probability that Liam wins £4. [2]

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(ii) Alfie counts the money raised by the cake stall, raffle stall and refreshments stall. He finds an estimate of the takings. To do this, he rounds the total from each stall down to the nearest pound and adds the 3 amounts together.

Alfie's estimate is £686.

Complete the following inequality to show the interval for the total raised by the three stalls. [1]

£686 $\leqslant$ total $\leqslant$ .....

.....

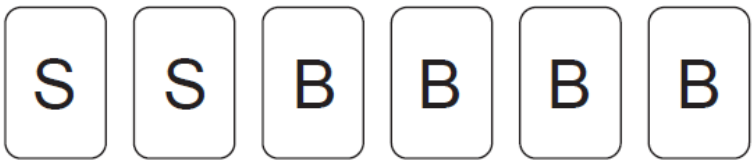
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Question taken from Eduqas examination paper 530003, June 2018

#6

Steve and Bob are playing a card game with these 6 cards.



In each round of the game:
- the 6 cards are shuffled and turned face down on a table
- Steve picks one card at random and keeps it
- Bob picks a card at random from the 5 remaining.

At the end of each round, Steve and Bob compare cards.
When
- both cards are S then Steve wins the game,
- both cards are B then Bob wins the game,
- the letters are different then neither of them wins the game and they play another round.

(a) Show that the probability that neither of them wins the first round is $\frac{8}{15}$. [3]

(b) The game stops when someone wins.
Calculate the probability that Steve wins when exactly 2 rounds have been played. [3]

Question taken from Eduqas examination paper 530003, June 2018

#7

Anya and Elis sit examinations at a college.

(a) Anya sits two examinations, one for Spanish and the other for French.
The probability that Anya passes Spanish is 0·6.
The probability that Anya passes French is 0·7.
The probability of Anya passing Spanish is **independent** of her passing French.

Anya tries to calculate the probability of her passing exactly one examination.

She writes $0{\cdot}6 \times 0{\cdot}3 = 0{\cdot}18$

(i) Without giving any calculations, explain why this answer is not fully correct. [1]

(ii) Calculate the probability of Anya passing exactly one examination. [2]

(b) Elis sits one examination.

The examination has 75 multiple choice questions.
For each question:

- there are five possible answers to choose from
- only one of the five possible answers is correct.

Elis knows the answer to 60% of the questions and will get these correct.
Of the remaining questions, he randomly selects one of the five possible answers.

A question is selected at random.
What is the probability that Elis answers this question correctly? [4]

Question taken from Eduqas examination paper 530003, May 2024

Probability of Independent / Dependent Combined Events: Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	4	
#3	4	
#4	6	
Total	17	

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#1

(a) On any working day, the probability that Don oversleeps in the morning is 0·3.

When he oversleeps, the probability that he catches his train to work is 0·25.
When Don does not oversleep, he always catches his train.

Work out the probability that, on a randomly chosen working day, Don catches his train to work. [3]

Question taken from Eduqas examination paper 530004, November 2020

#2 Cody has a bag containing 8 red sweets and 9 green sweets.

Cody randomly selects one sweet at a time and eats it.

(a) Calculate the probability that the first two sweets Cody eats are red. [2]

(b) Calculate the probability that the first two sweets Cody eats are the same colour. [2]

Question taken from Eduqas examination paper 530004, November 2023

#3



Noah and Jenny play a game.
Each shoots an arrow at a target.
The arrow is removed from the target after each shot.

For each of their shots:

- Noah hits the target with a probability of $\frac{1}{5}$.
- Jenny hits the target with a probability of $\frac{3}{10}$.

Noah and Jenny take it in turns to shoot an arrow at the target.
In the game, Noah shoots the first arrow.
When one of them hits the target the game ends and that person wins the game.

(a) Calculate the probability that Jenny wins the game on her first shot. [2]

(b) Calculate the probability that Noah wins the game on his second shot. [2]

Question taken from Eduqas examination paper 530004, June 2024

#4

The driving theory test consists of 50 questions.
At least 43 of these questions must be answered correctly to pass the test.
For each question in the test, four possible answers are given. Only one of these answers is correct.

Waldo takes the test.
Waldo knows 78% of the facts assessed in the test.
For each question based on these facts he selects the correct answer.

On all other questions he randomly selects one of the four possible answers.

(a) A question is selected at random from the paper.
Calculate the probability that Waldo correctly answers the question. [4]

(b) Is Waldo likely to pass his driving theory test?

Yes ☐ No ☐

You must show all your working to support your answer. [2]

Question taken from Eduqas examination paper 530004, June 2019

Tree Diagrams: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	4	
#2	5	
#3	6	
#4	6	
#5	7	
#6	7	
Total	35	

created with
eduqas Part of WJEC Question Bank

#1

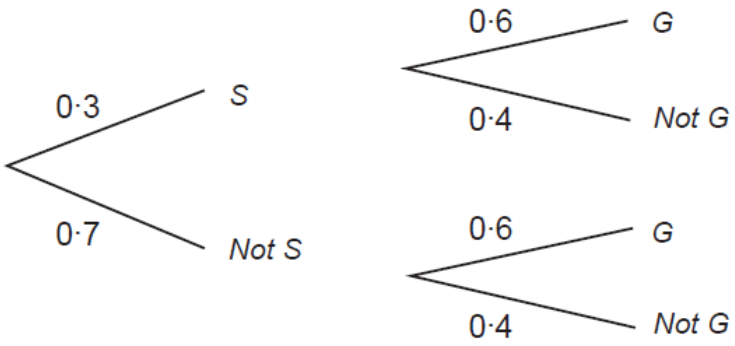
Jan's hobbies are sewing and gardening.

Each week the probability that she spends:

- Monday evening sewing (S) is 0·3,
- time gardening on Friday (G) is 0·6.

These events are independent.

The tree diagram shows this information.



Calculate the probability that, in a randomly selected week,

(a) Jan spends Monday evening sewing but does not spend time gardening on Friday, [2]

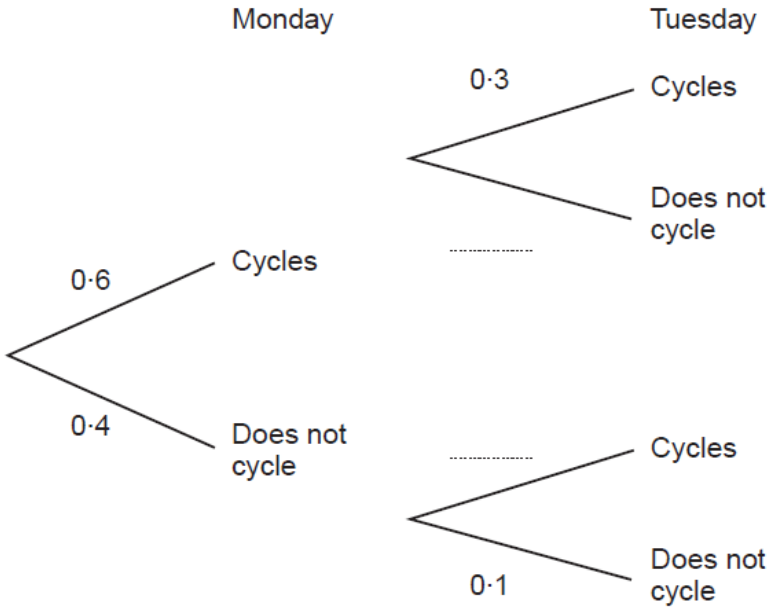
(b) Jan does not spend Monday evening sewing but does spend time gardening on Friday. [2]

Question taken from Eduqas examination paper 530003, November 2020

#2

The probability that Kathy cycles to work on Monday is 0·6.
If she cycles to work on Monday, the probability that she cycles to work on Tuesday is 0·3.
If she does **not** cycle to work on Monday, the probability that she does **not** cycle to work on Tuesday is 0·1.

(a) Complete the tree diagram. [1]



(b) Calculate the probability that Kathy cycles to work on both Monday and Tuesday. [2]

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(c) Calculate the probability that Kathy does **not** cycle to work on either day. [2]

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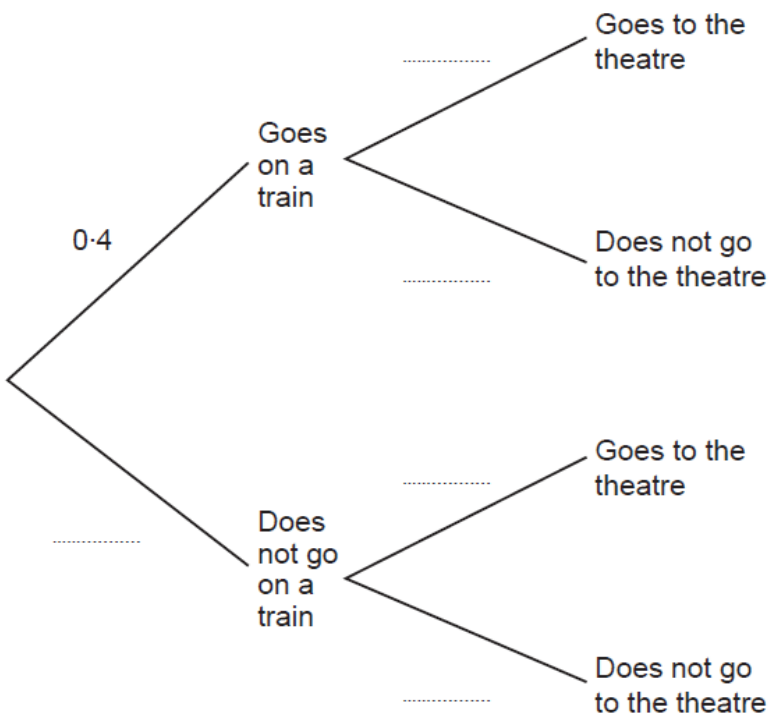
Question taken from Eduqas examination paper 530003, May 2022

#3 Kate is visiting London.

The probability that she will go on a train is 0·4.
The probability of Kate going to the theatre is independent of her going on a train.

The probability that she goes on a train and goes to the theatre is 0·28.

(a) Complete the following tree diagram. [4]



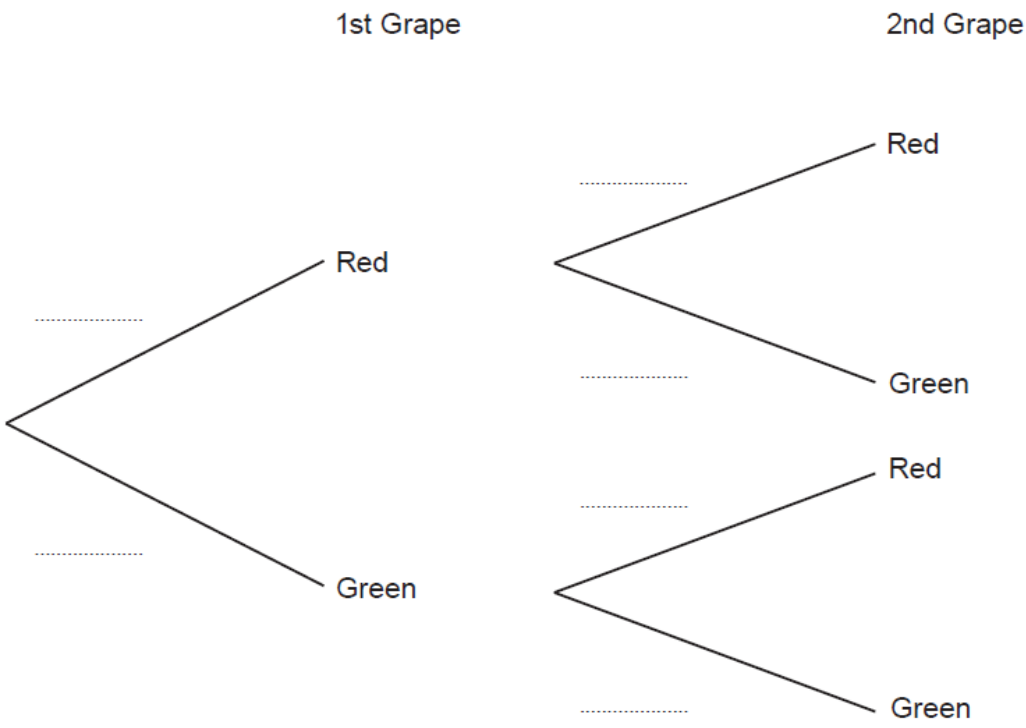
(b) Calculate the probability that Kate does not go on a train and does not go to the theatre. [2]

Question taken from Eduqas examination paper 530003, November 2023

#4

Vera has a pot containing 4 red grapes and 6 green grapes.
She takes a grape at random and eats it.
She then takes another grape at random and eats it.

(a) Complete the probability tree to show this information. [3]



(b) Work out the probability that the second grape Vera eats is green. [3]

Question taken from Eduqas examination paper 530003, November 2019

#5

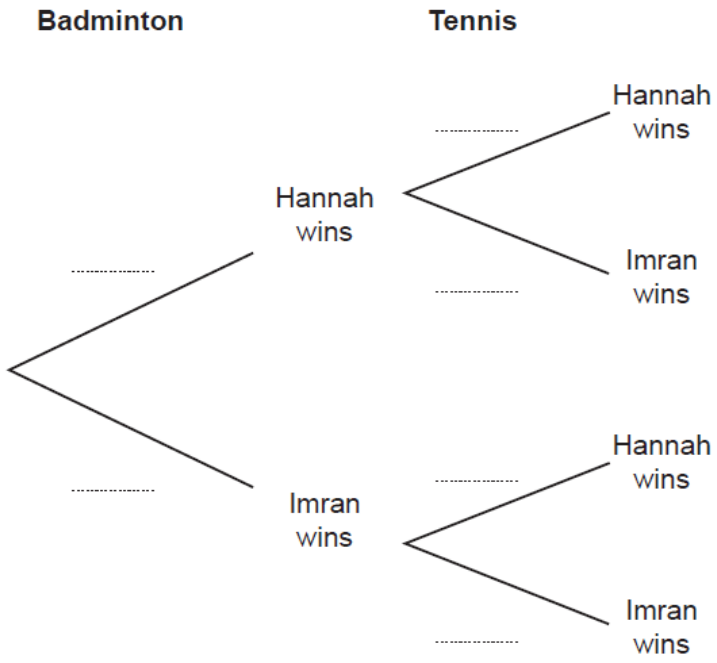
Hannah and Imran often play badminton and tennis matches against each other.

The probability that Hannah wins a badminton match is $\frac{9}{10}$.

The probability that Hannah wins both a badminton match **and** a tennis match is $\frac{9}{50}$.

One Saturday, Hannah and Imran play one badminton match and one tennis match.
The outcomes of the matches are independent.

(a) Complete the tree diagram below. [4]



(b) Calculate the probability that Hannah wins exactly one match. [3]

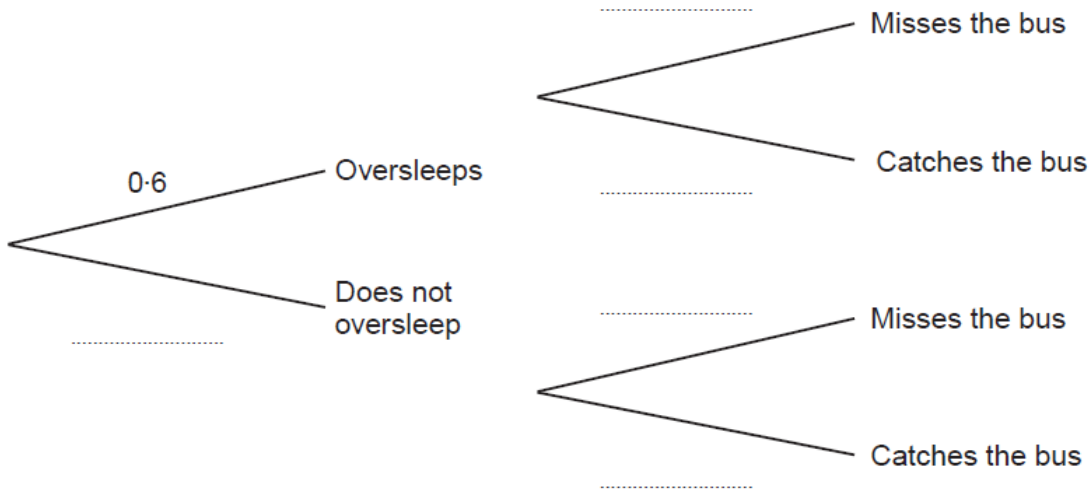
Question taken from Eduqas examination paper 530003, November 2024

#6

Sam needs to catch the 8 a.m. bus to get to work on time.
The probability that Sam oversleeps is 0·6.

When Sam oversleeps, the probability that he misses the bus is 0·8.
When Sam does not oversleep, the probability that he misses the bus is 0·3.

(a) Complete the following tree diagram to show this information. [2]



(b) Calculate the probability that Sam oversleeps and misses the bus. [2]

(c) Calculate the probability that Sam catches the bus.
You must show all your working. [3]

Question taken from Eduqas examination paper 530003, June 2019

Tree Diagrams: Calculator

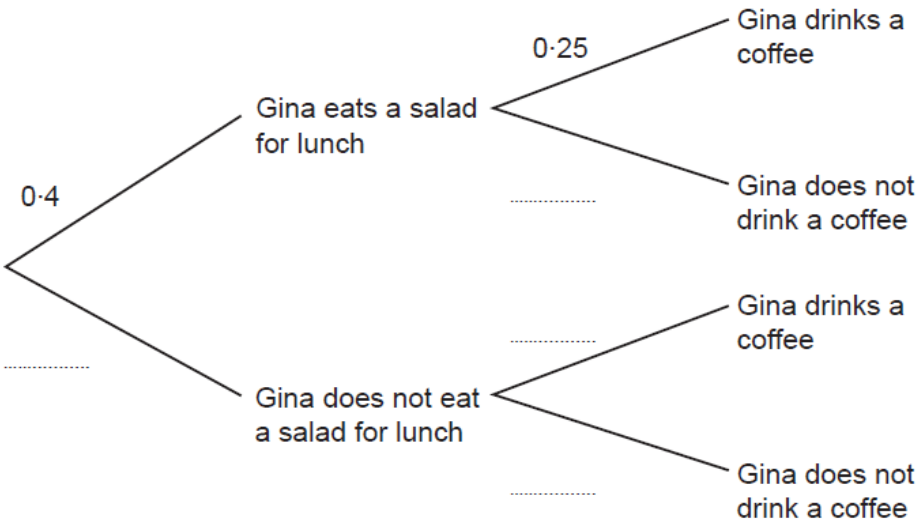
Question	Maximum Mark	Mark Awarded
#1	4	
#2	6	
#3	7	
#4	8	
Total	25	

created with
eduqas Part of WJEC Question Bank

#1

For her lunch, Gina sometimes eats a salad and sometimes drinks a coffee.
The probability she eats a salad for lunch on a given day is 0·4.
The probability she drinks a coffee on a given day is 0·25.
Eating a salad for lunch and drinking a coffee are independent.

(a) Complete the following tree diagram. [2]



(b) Calculate the probability that, on a given day, Gina does not eat a salad for lunch but does drink a coffee. [2]

Question taken from Eduqas examination paper 530004, June 2024

#2

Dora has two boxes, *A* and *B*.
The boxes contain beads which are identical in shape.

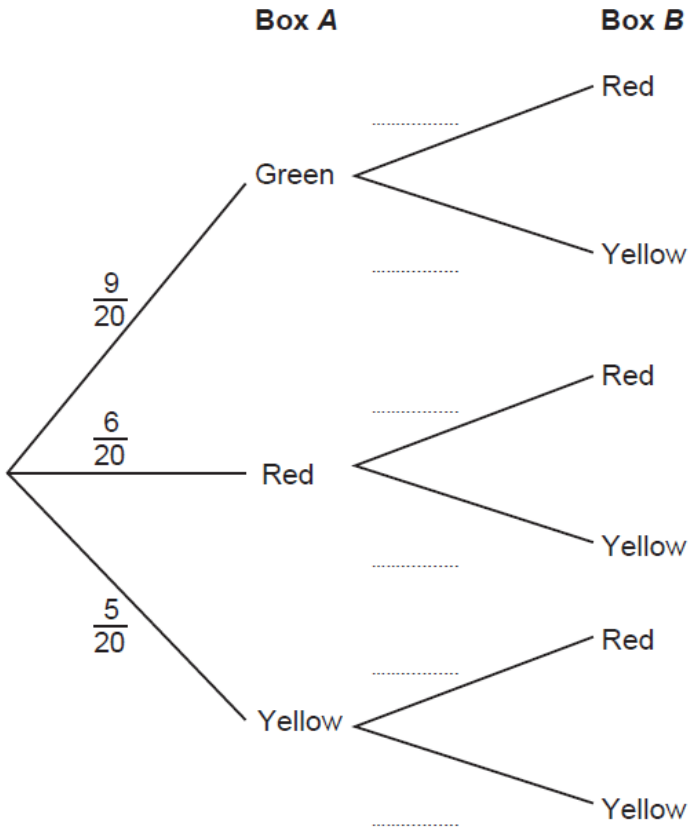
Box *A* contains 9 green, 6 red and 5 yellow beads.
Box *B* contains 12 red and 8 yellow beads.

Dora takes a bead at random from box *A*. If the bead is:

- green, she puts it back in box *A*
- red or yellow, she puts it in box *B*.

She then takes a bead at random from box *B*.

(a) Complete the tree diagram. [3]



(b) Find the probability that Dora takes two beads of the same colour. [3]

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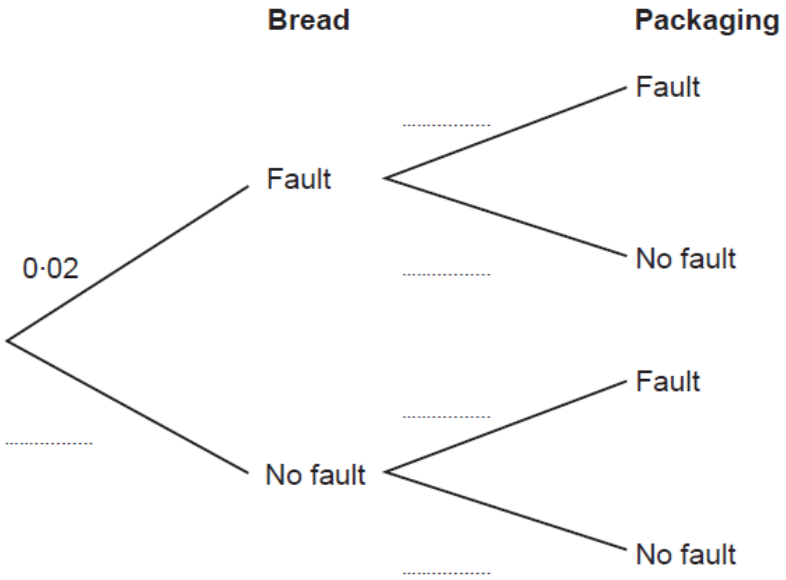
Question taken from Eduqas examination paper 530004, November 2022

#3 A factory makes loaves of bread which are wrapped in packaging.

Independently, for any loaf wrapped in packaging, chosen at random:

- The probability that there is a fault with the bread is 0·02.
- The probability that there is a fault with the packaging is 0·01.

(a) Complete the tree diagram to show this information. [2]



(b) A loaf wrapped in packaging is chosen at random.

(i) Calculate the probability that neither the bread nor the packaging has a fault. [2]

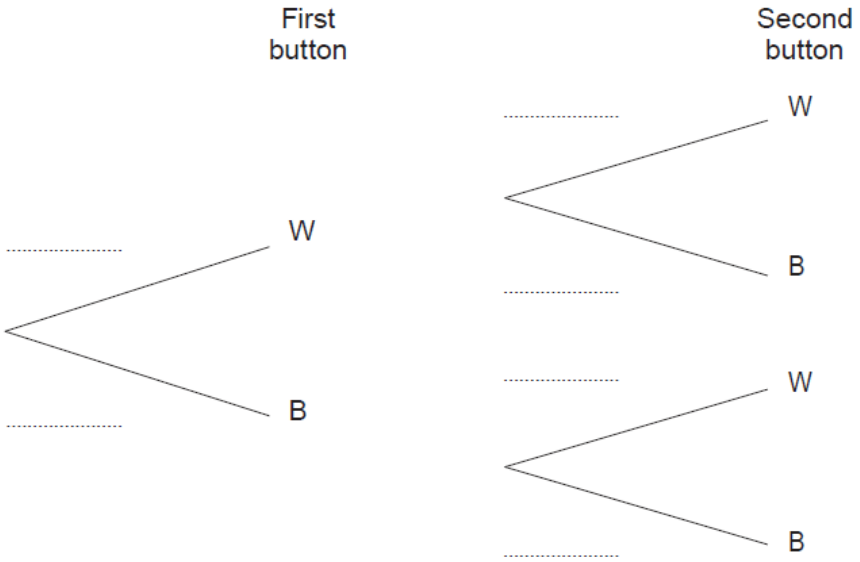
(ii) Calculate the probability that either the bread or the packaging has a fault but they do not both have a fault. [3]

Question taken from Eduqas examination paper 530004, June 2023

#4

(a) Rita has a box containing 12 buttons, 5 are white (W) and the rest are blue (B).
Rita takes 2 buttons from the box at random, without replacement.

Complete the tree diagram. [3]



(b) Calculate the probability that at least one of the buttons Rita takes from the box is white. [2]

(c) Rita puts the 2 buttons back into the box.
She then takes 3 buttons from the box at random, without replacement.

What is the probability that the second and the third buttons she takes are both blue? [3]

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Question taken from Eduqas examination paper 530004, November 2021

Constructing and / or Interpreting Tables / Charts / Diagrams: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
#2	2	
#3	2	
#4	4	
Total	10	

created with
eduqas Part of WJEC Question Bank

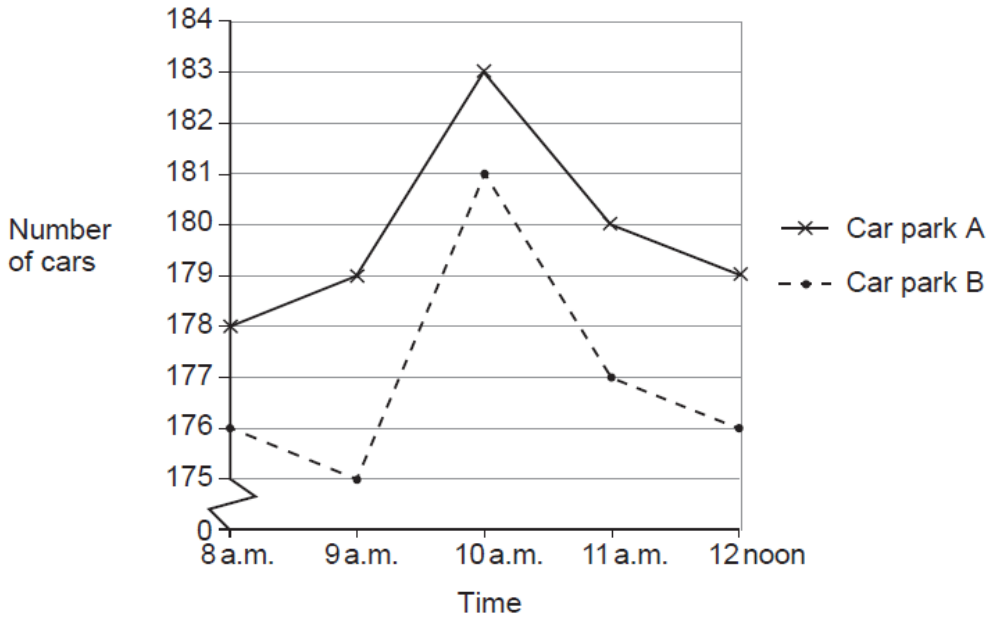
#1

Peter and Paula record the number of cars in each of two airport car parks, A and B, between 8 a.m. and 12 noon one Saturday morning.
This was done to find out if there was a peak time for parking during that period.

The table shows the data they collected.

Time	8 a.m.	9 a.m.	10 a.m.	11 a.m.	12 noon
Number of cars in car park A	178	179	183	180	179
Number of cars in car park B	176	175	181	177	176

Paula draws this graph to represent the data.



Peter says,

"This graph is not sensible as it does not show the data fairly."

(a) What has been done in the drawing of the graph that has made Peter think this? [1]

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(b) What error might this lead to, for people who do not look carefully at the graph? [1]

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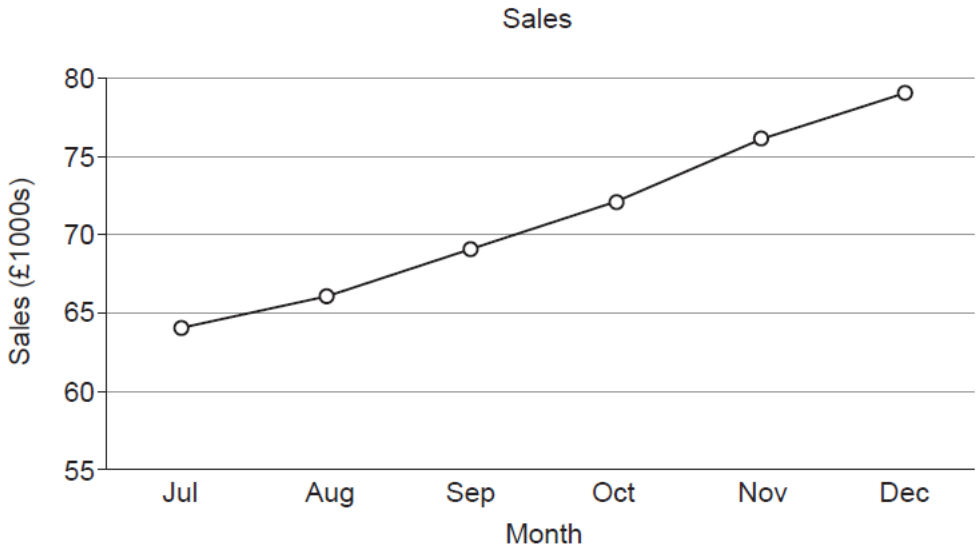
Question taken from Eduqas examination paper 530003, November 2020

#2

Sara works for the winter-clothing company Zipski.
The table below shows the monthly sales figures for 2023.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sales (£1000s)	90	83	75	68	65	62	64	66	69	72	76	79

Sara used the information in the table to draw the graph below.



Give **two** reasons why Sara's graph may be misleading. [2]

Reason 1: .....

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Reason 2: .....

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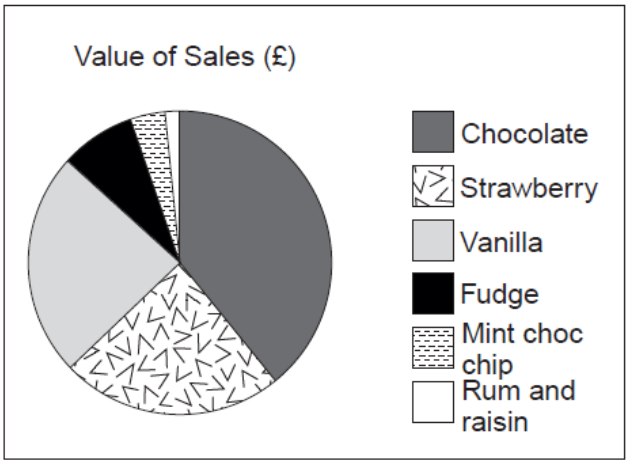
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Question taken from Eduqas examination paper 530003, May 2024

#3 Cherie is in charge of marketing for a tourist attraction.

(a) One weekend, she collects some data about the value of ice cream sales from the café. She records her data in a table and uses it to draw a pie chart.

Ice cream flavour	Value of sales (£)
Chocolate	500
Strawberry	300
Coffee	0
Vanilla	300
Fudge	100
Green tea	0
Mint choc chip	50
Rum and raisin	20



State one criticism of the use of a pie chart to display her data. [1]

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(b) Cherie also records the number of visitors to the tourist attraction each season for 4 years.
Her results are shown in the table.

	Season	Winter	Spring	Summer	Autumn
Visitors (thousands)	2015	9	14	19	13
	2016	9	13	17	12
	2017	6	11	14	9
	2018	4	8	15	10

Comment on the trend in the **annual** number of visitors shown by the data in the table. [1]

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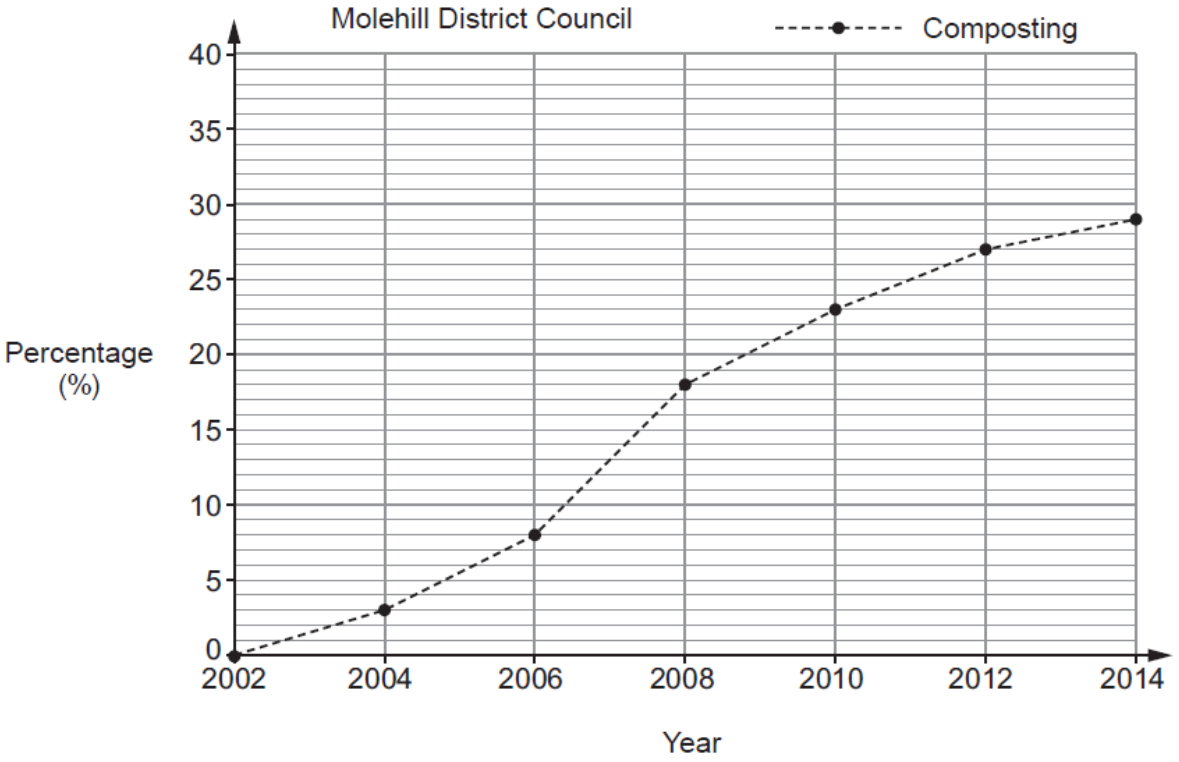
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Question taken from Eduqas examination paper 530003, June 2019

#4

The graph shows information about the percentage of waste **composted** by Molehill District Council from 2002 to 2014.



The table shows information about the percentage of waste **recycled** by Molehill District Council from 2002 to 2014.

Year	2002	2004	2006	2008	2010	2012	2014
Recycling (%)	15	18	32	36	32	30	27

(a) On the grid above, plot the data for recycling. [1]

(b) (i) The mayor of Molehill says,

'One year, the percentage of waste recycled was 6 times the percentage of waste composted.'

Write down the year for which this comment is correct. [1]

.....

(ii) Between which two years did the percentage of waste composted increase the most? [1]

Between ..... and .....

(iii) Using the information provided, write one comment, **comparing** how the percentages of waste recycled **and** composted have changed between 2002 and 2014. [1]

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Question taken from Eduqas examination paper 530003, June 2018

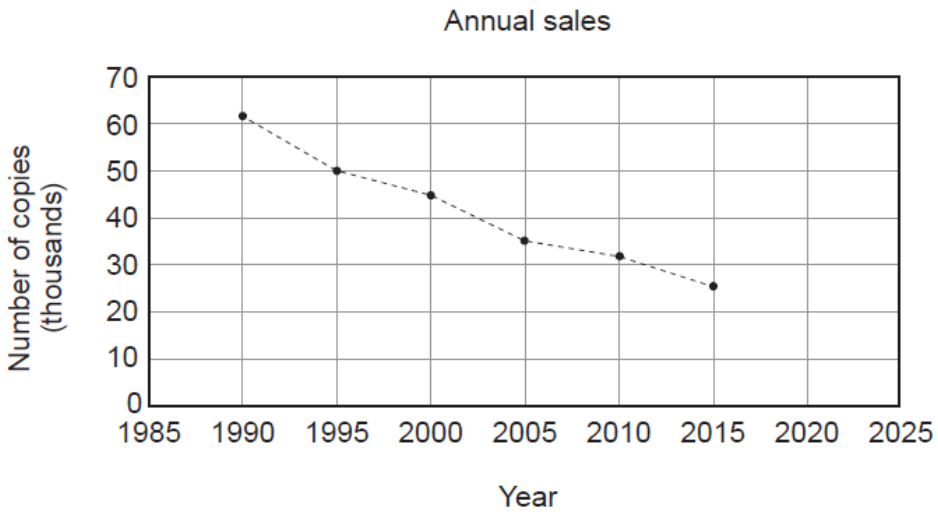
Constructing and / or Interpreting Tables / Charts / Diagrams: Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	5	
Total	8	

created with
eduqas Part of WJEC Question Bank

#1

The graph shows the number of copies of a local newspaper sold over a 25-year period.



(a) Eva uses the graph to predict that about 10 thousand newspapers will be sold in 2025.

Explain why her prediction may not be reliable. [1]

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(b) The ratio of adults who read news online to those who do not is 16 : 9.
The adult population of the UK is about 52 000 000.

Calculate an estimate of the number of adults in the UK who read news online. [2]

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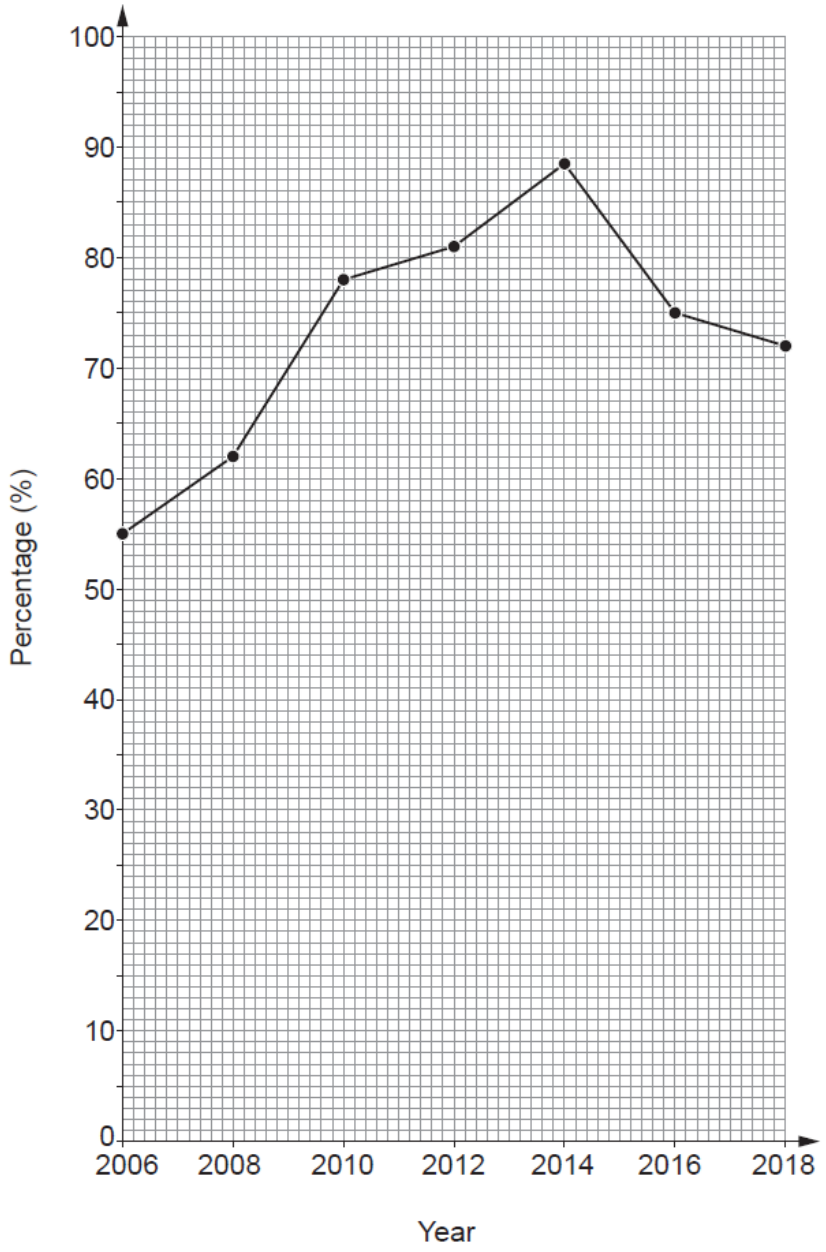
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Question taken from Eduqas examination paper 530004, November 2020

#2 The diagram shows information about the percentage of households in Eduvale that owned a **desktop** computer for the even-numbered years from 2006 to 2018.



(a) (i) Complete this statement. [1]

The percentage of households that owned a desktop computer decreased the most between the even-numbered years ..... and ..... .

(ii) Jane says,

"The graph shows that 70% of people owned a desktop computer in 2009 because it passes through that point."

Is Jane correct?

Yes ☐ No ☐

Explain how you decide. [1]

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(b) The table shows information about the percentage of households in Eduvale that had an internet connection for the even-numbered years from 2006 to 2018.

Year	2006	2008	2010	2012	2014	2016	2018
Internet connection (%)	45	53	66	79	84	88	89

(i) On the diagram on page 24, plot the information for internet connection. [1]

(ii) In which even-numbered year was the difference in the percentage of households in Eduvale owning a desktop computer and the percentage of households having an internet connection the greatest? [1]

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(iii) Eduvale is a large town in a county.

Comment on how, in this **county**, the percentage of households owning a desktop computer and the percentage of households having an internet connection are **likely** to have changed in this time period. [1]

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Question taken from Eduqas examination paper 530004, June 2023

Averages and Range: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	5	
Total	5	

created with
eduqas Part of WJEC Question Bank

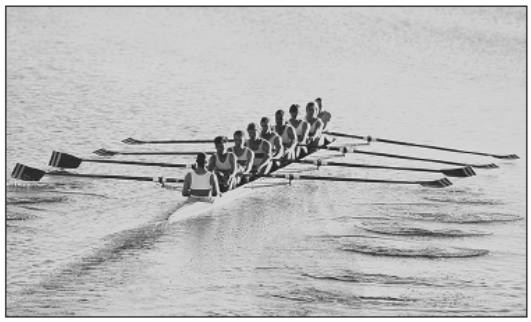
#1

(a) In an athletics club:

- 20 of the female athletes have a mean height of 170 cm
- 30 of the male athletes have a mean height of 180 cm.

What is the mean height of these 50 athletes? [4]

(b) A boat crew has 8 rowers and a cox who steers.



The heights, in cm, of the 9 people in the crew are as follows.

150 183 193 201 203 198 201 188 193

The mean of these heights is 190 cm.
Explain why the mean is not the best average to use for this data set. [1]

Question taken from Eduqas examination paper 530003, May 2023

Averages and Range: Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
Total	2	

created with
eduqas Part of WJEC Question Bank

#1

Gary measures the depth of a river in 6 places between two bridges.
The depths are as follows:

48·8 cm 55·1 cm 34·6 cm 75·2 cm 85·7 cm 96·1 cm

Gary decides to write each of the 6 depths correct to the nearest 10 cm.
He states that the median depth of the river between the two bridges is 70 cm.

Give two reasons why the method Gary used to obtain this median depth leads to an inaccurate result. [2]

Reason 1:

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Reason 2:

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Question taken from Eduqas examination paper 530004, November 2018

Properties of Populations from a Sample: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	3	
#3	3	
Total	9	

created with
eduqas Part of WJEC Question Bank

#1

Vikram wanted to find out how many moths there were in a small woodland.



One night, Vikram captured a random sample of 12 moths and marked them.
He then released them back into the woodland.

The next night, Vikram captured a second random sample of 30 moths.
He found that 9 of the moths in the second sample had been marked.

Vikram estimated that there were 40 moths in the woodland.

(a) Show that Vikram's estimate of the number of moths was correct. [2]

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(b) Comment on how reliable Vikram's estimate was likely to be. [1]

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Question taken from Eduqas examination paper 530003, May 2022

#2

Mike wants to find out how many fish there are in his lake.

On Monday evening,
Mike captured a random sample of 100 fish and tagged them.
He then released them back into the water.

On Tuesday evening,
Mike captured a second random sample of 50 fish and counted the number that had been tagged.

He found that 10 of the fish in the second sample had been tagged.

Mike will allow fishing at his lake when there are more than 800 fish.

You may assume that the number of fish in the lake stays the same between the two samples being taken.

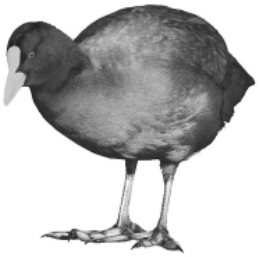
Should Mike allow fishing at his lake?
Show calculations to justify your decision. [3]

Decision: Allow fishing ☐ Do not allow fishing ☐

Question taken from Eduqas examination paper 530003, November 2018

#3

A scientist wants to find out how many coots there are on a lake.



One Monday morning, she captures a random sample of 48 coots and tags them.
She then releases them back onto the lake.

The following Monday morning, she captures a second random sample of 30 coots and counts the number that are tagged.

The scientist finds that 20 of the coots in the second sample are tagged.

Assume that the number of coots on the lake remains constant.

How many coots are there likely to be on the lake?
Show calculations to justify your answer. [3]

Question taken from Eduqas examination paper 530003, November 2019

Properties of Populations from a Sample: Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
Total	3	

created with
eduqas Part of WJEC Question Bank

#1

There are 1800 eels in a lake.

On Saturday morning, Sadia captured a random sample of x eels from the lake and tagged them.
She then released them back into the lake.

On Sunday morning, Sadia captured a second random sample of 150 eels from the lake.
Seven of the eels in this sample were already tagged.

Use these values to calculate an estimate for x, the number of eels tagged in Sadia's first sample. [3]

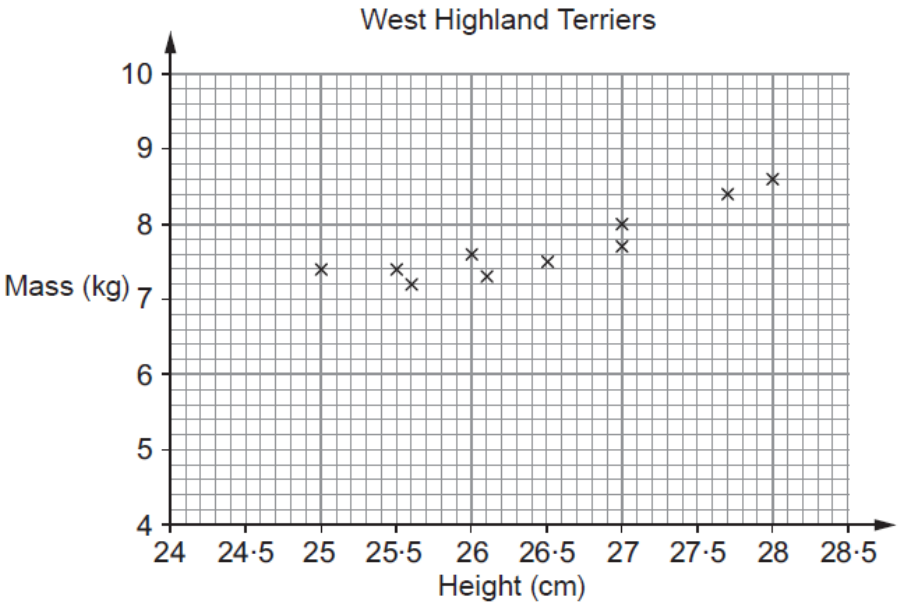
Question taken from Eduqas examination paper 530004, November 2024

Scatter Diagrams: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	4	
#3	4	
Total	11	

created with
eduqas Part of WJEC Question Bank

#1 The scatter diagram shows the height and mass of 10 dogs.
These dogs are all West Highland Terriers.



(a) Draw a line of best fit on the scatter diagram. [1]

(b) Estimate the mass of a West Highland Terrier that has a height of 26·7 cm. [1]

Estimated mass is ..... kg

(c) Another dog has a mass of 8·2 kg and a height of 35 cm.

Is this dog likely to be a West Highland Terrier?

Yes ☐ No ☐

Explain your answer. [1]

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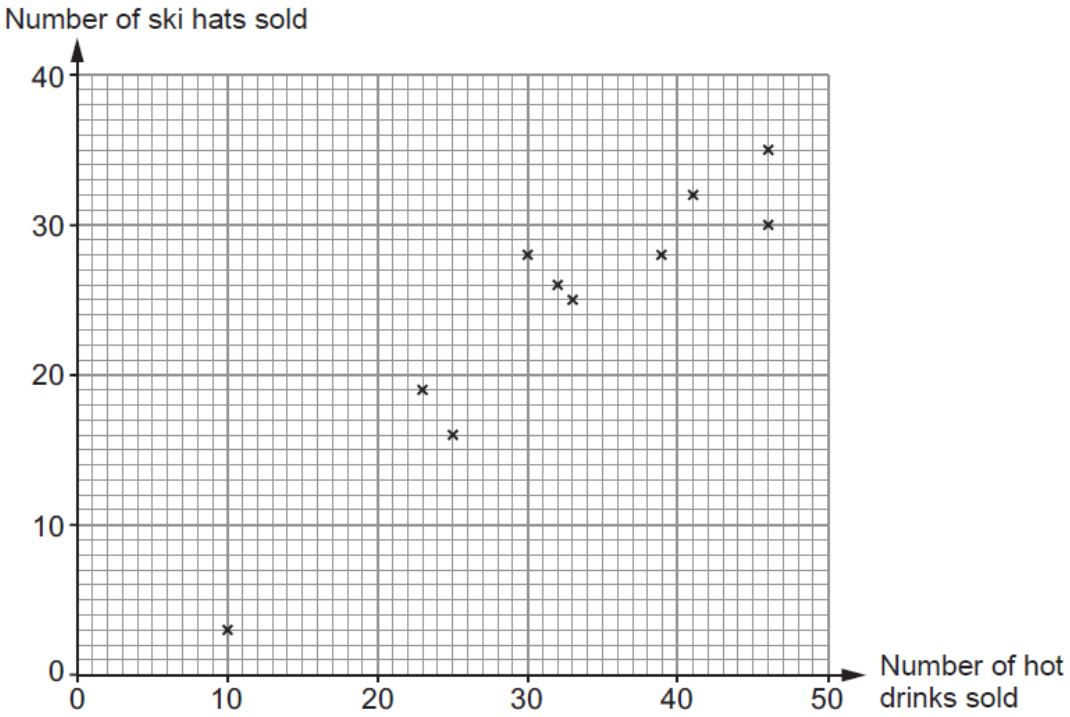
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Question taken from Eduqas examination paper 530003, November 2018

#2 *The Shorts Hut* is a shop that sells sports clothing and has a customer café.

(a) The manager plots some sales data in a scatter graph.

The graph shows the number of hot drinks sold and the number of ski hats sold each day for 10 days.



The manager says that this graph shows that an increase in the sale of hot drinks causes an increase in the sale of ski hats because the correlation is positive.

Explain why the manager is incorrect. [1]

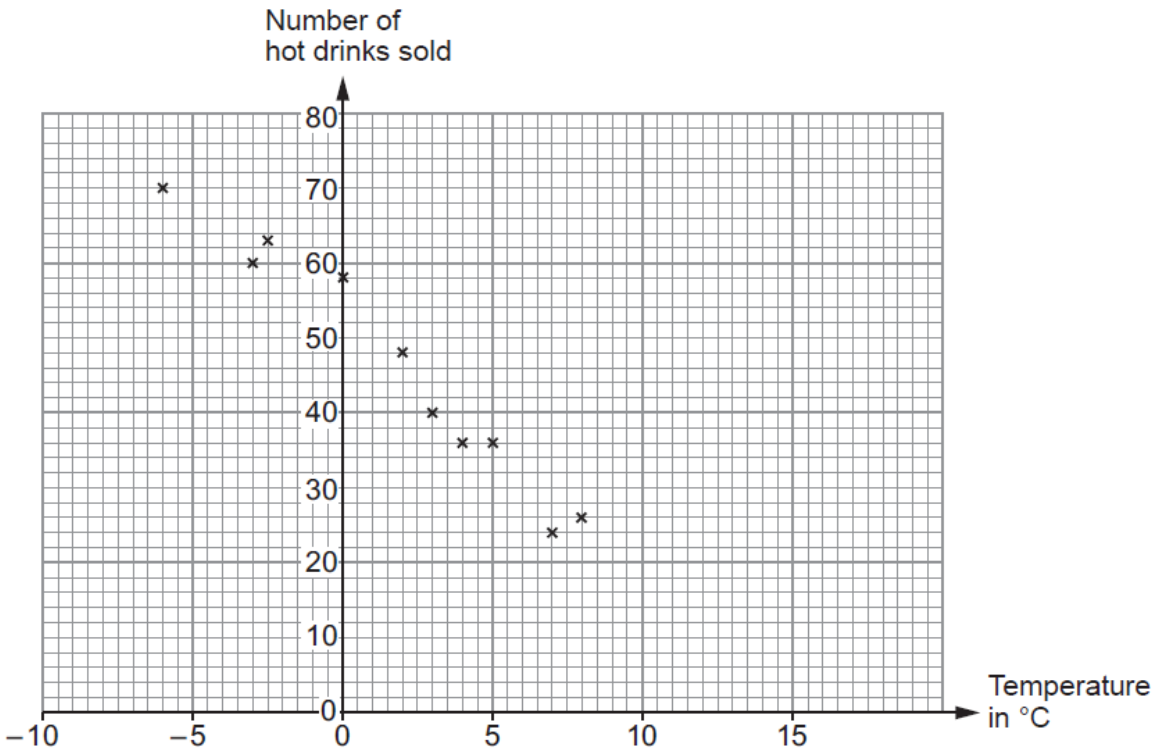
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(b) The manager plots another scatter graph showing the temperature, in °C, at 9 a.m. and the number of hot drinks sold during the first hour on each of 10 days.



(i) Draw a line of best fit on the scatter graph. [1]

(ii) Estimate the number of hot drinks the café will sell when the temperature is 6°C. [1]

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(iii) Comment on how suitable the graph is for estimating the number of hot drinks sold when the temperature is more than 17°C.
You must give a reason for your answer. [1]

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Question taken from Eduqas examination paper 530003, June 2018

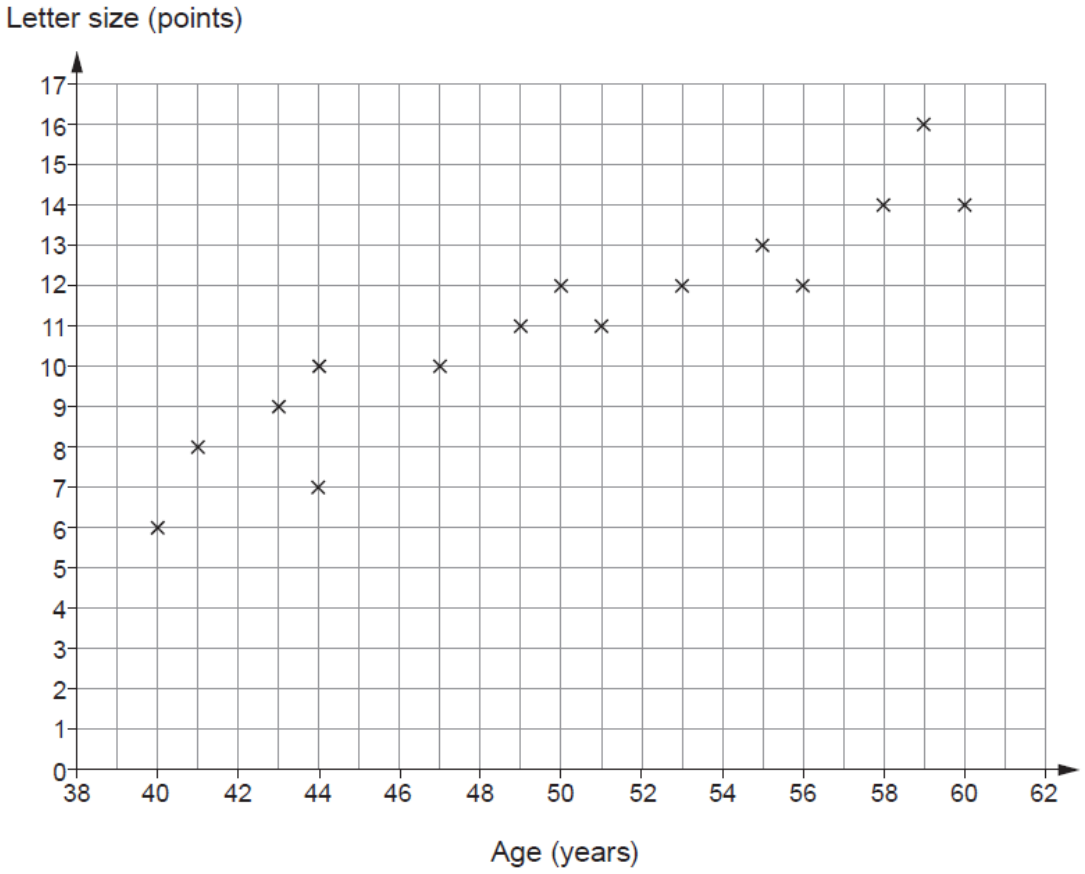
#3

Fifteen people aged between 40 and 60 take an eye test as part of an experiment.

The test involves reading letters from a chart.
Each line of letters is smaller than the line above.
Letter size is measured in points.



The scatter graph below shows the age of and the smallest letter size read by each person.



(a) The mean age is 50 years and the mean letter size is 11 points.

Using this information, draw a line of best fit on the scatter graph. [2]

(b) Use the scatter graph to answer each of the following questions.

(i) Estimate the smallest letter size which can be read by a person aged 52. [1]

.....

(ii) Jared is 30 years old.

Should the scatter graph be used to estimate the smallest letter size that Jared can read?

Yes ☐ No ☐

Give a reason for your answer. [1]

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Question taken from Eduqas examination paper 530003, November 2021

Scatter Diagrams: Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
Total	2	

created with
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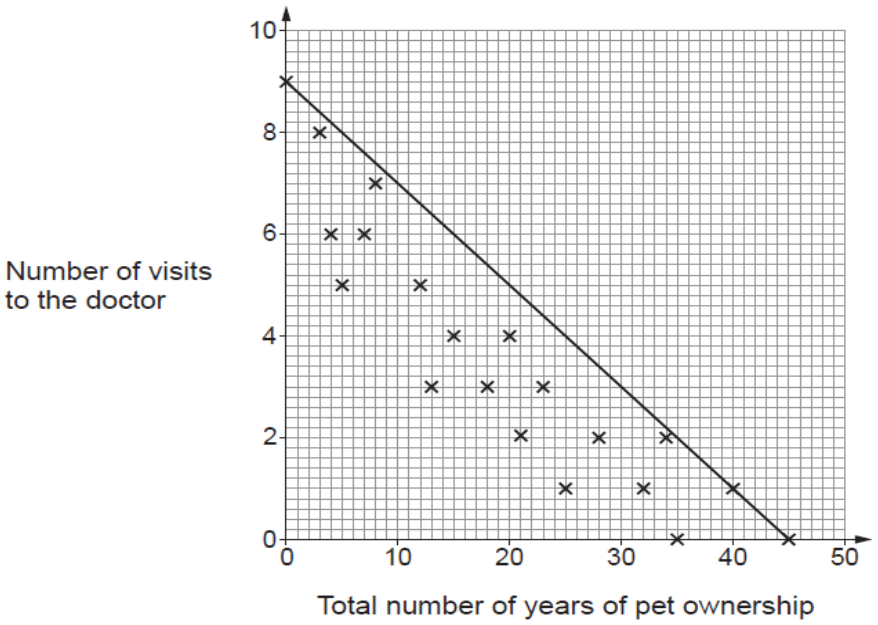
#1

Debbie collects data about a group of 20 people.

Her data is:

- the total number of years for which they have owned a pet
- the number of visits they have each made to their doctor in the last year.

The scatter graph shows her results and her attempt to draw a line of best fit for the data.



(a) Make a criticism of Debbie's line of best fit. [1]

.....

.....

.....

(b) Debbie says,

Because there is a negative correlation, owning a pet for longer **causes** people to need to visit the doctor less often.

Is Debbie correct?

Yes ☐ No ☐

Explain how you decide. [1]

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Question taken from Eduqas examination paper 530004, November 2022

Designing / Criticising Questionnaires: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
#2	4	
#3	4	
Total	10	

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eduqas Part of WJEC Question Bank

#1

Zena is carrying out a survey to find out how people learn about **recent national political events**.

Here is her question.

Which method do you use to learn about politics?
Tick (✓) one box.

Social media ☐ Newspaper ☐ Radio ☐

Write a better version of Zena's question in the box below.
You must include response boxes. [2]

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Question taken from Eduqas examination paper 530003, November 2021

#2

Gita is carrying out a survey to find out what people think of a proposed new road for Redville.

(a) Gita decides to ask the first 20 people she meets at Redville bus station between 8 a.m. and 9 a.m. on a Monday morning.

Give **two** reasons why this plan is unlikely to produce reliable results. [2]

Reason 1:

.....

.....

Reason 2:

.....

.....

(b) Here is a question from Gita's survey:

How often do you use your car?

1 – 2 ☐ 3 – 4 ☐ 4 – 5 ☐ 6 + ☐

Make **two** criticisms of Gita's question. [2]

Criticism 1:

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Criticism 2:

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Question taken from Eduqas examination paper 530003, November 2019

#3

Pippa and Joe are working on a school project.
The project is based on the use of the local leisure facilities.

(a) Pippa decides to ask adults how much they spend on gym membership each month.
In the box below, write a suitable question with appropriate response boxes to collect this information. [2]

Question

.....

.....

Response boxes

(b) Joe asked some adults how many hours they each spent at the leisure centre during the previous week.
His results are shown below.

Number of hours	0–4	5–9	10–14	15–19	20–24
Number of adults	9	2	1	1	2

Joe accurately calculated an estimate of the mean time spent per adult to be 7 hours.

In his project he stated:

'On average, the adults in my survey each spent 7 hours at the leisure centre last week.'

(i) Explain why the mean is not the best average to use for this data. [1]

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(ii) Give **one** other reason why Joe's results may not be reliable. [1]

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Question taken from Eduqas examination paper 530003, May 2024

Designing / Criticising Questionnaires: Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
Total	2	

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eduqas Part of WJEC Question Bank

#1 Eric is carrying out a survey for a company that makes energy drinks, Pop and Whizz.
He asks 200 randomly selected adults to complete his survey.

(a) Pop costs £1 per bottle.
As part of his survey, Eric wants to find out how much money each month adults spend on Pop.

In the box below, write a suitable question for his survey to collect this information.
You must include response boxes. [2]

Question taken from Eduqas examination paper 530004, June 2023

Estimating the Mean from Grouped Frequency Tables: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	6	
Total	6	

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#1

Jim works in the office for a pizza delivery company.
Last night he recorded the times for the first 50 deliveries.
These times are recorded in the table below.



Delivery time (t mins)	Number of deliveries
$0 < t \leqslant 10$	10
$10 < t \leqslant 20$	12
$20 < t \leqslant 30$	16
$30 < t \leqslant 40$	12

(a) Calculate an estimate of the mean time for these 50 deliveries. [4]

(b) Calculate an estimate of the percentage of these deliveries that took 25 minutes or more. [2]

Question taken from Eduqas examination paper 530003, November 2024

Estimating the Mean from Grouped Frequency Tables: Calculator

Question	Maximum Mark	Mark Awarded
#1	4	
#2	4	
#3	5	
#4	5	
#5	5	
#6	5	
#7	6	
#8	6	
#9	8	
Total	48	

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#1

The table gives a summary of the masses, m grams, of 30 buzzards.



Mass, m (grams)	$600 \leqslant m < 700$	$700 \leqslant m < 800$	$800 \leqslant m < 900$	$900 \leqslant m < 1000$
Frequency	8	7	4	11

(a) Moeen uses the midpoint of each group to calculate an estimate of the mean mass of these buzzards.
He does this correctly.

Calculate Moeen's answer. [3]

(b) Deeta decides to estimate the mean mass of these buzzards.
She uses the values 600, 700, 800 and 900 rather than the midpoints.

Explain why her method is unlikely to give a good estimate of the mean mass. [1]

Question taken from Eduqas examination paper 530004, November 2022

#2

The table shows the mass of 90 carrots grown by a gardener.

Mass, m (grams)	Number of carrots
$30 < m \leqslant 60$	9
$60 < m \leqslant 90$	33
$90 < m \leqslant 120$	38
$120 < m \leqslant 150$	8
$150 < m \leqslant 180$	2

Calculate an estimate for the mean mass of these carrots. [4]

Question taken from Eduqas examination paper 530004, June 2022

#3

The tourist office in Trofenberg displays the snowfall data each month in a table.

The table shows snowfall in Trofenberg for each day during January.

Snowfall, s (cm)	Number of days
$0 \leqslant s < 20$	1
$20 \leqslant s < 40$	8
$40 \leqslant s < 60$	9
$60 \leqslant s < 80$	7
$80 \leqslant s < 100$	6

(a) Calculate an estimate for the mean daily snowfall in Trofenberg for January.
You must show all your working. [4]

(b) There were 9 days when the snowfall was between 40 cm and 60 cm.
On each of these days, the snowfall was actually between 57 cm and 59 cm.

Explain why the estimate for the mean daily snowfall in January may still be fairly accurate. [1]

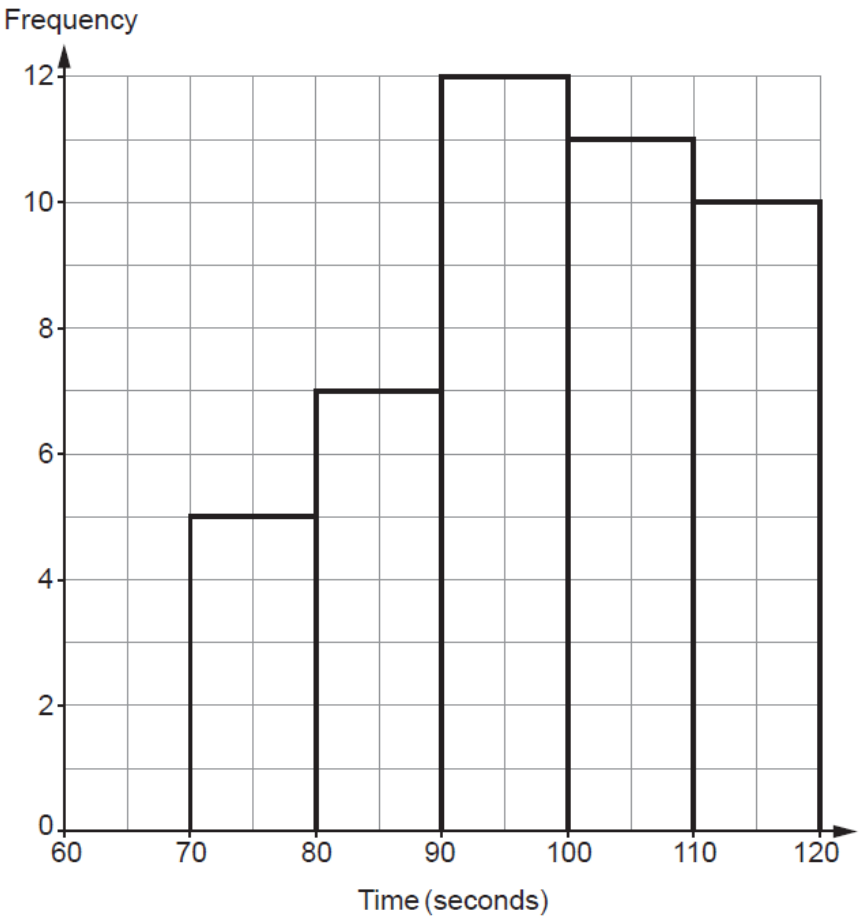
Question taken from Eduqas examination paper 530004, June 2018

#4

45 students took part in a 400 m race.
Their times, in seconds, were recorded.
The frequency diagram below shows the results.

The groups used are as follows:

$70 \leqslant \text{time} < 80$, $80 \leqslant \text{time} < 90$, $90 \leqslant \text{time} < 100$, $100 \leqslant \text{time} < 110$ and $110 \leqslant \text{time} < 120$.



Calculate an estimate for the mean time it took to complete the race. [5]

Question taken from Eduqas examination paper 530004, June 2024

#5

Regan caught 70 fish on a fishing trip.
He measured the length of each of the fish in centimetres.

The table shows his results.

Length, l (centimetres)	Number of fish
$60 \leqslant l < 65$	19
$65 \leqslant l < 70$	17
$70 \leqslant l < 75$	23
$75 \leqslant l < 80$	10
$80 \leqslant l < 85$	1

(a) Calculate an estimate for the mean length of these fish. [4]

(b) Regan thinks that the median length of fish is in the group $70 \leqslant l < 75$.
Is Regan correct?

Yes ☐ No ☐

Give the reason for your answer. [1]

Question taken from Eduqas examination paper 530004, November 2023

#6

The table shows the time, t minutes, taken by 600 people travelling to a flower show by car.

Time, t (minutes)	Frequency
$20 < t \leqslant 40$	68
$40 < t \leqslant 80$	186
$80 < t \leqslant 100$	238
$100 < t \leqslant 150$	108

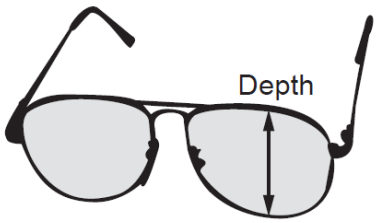
(a) Calculate an estimate of the mean travelling time for these 600 people.
You must show all your working. [4]

(b) Road works delayed each of these 600 people by 3 minutes.

What would the mean travelling time have been without these road works? [1]

Question taken from Eduqas examination paper 530004, November 2021

#7 Marie works for an optician.
She records the depth of a lens in each of the 100 pairs of glasses on display.



Her results are summarised in the table.

Depth of lens, x mm, to the nearest mm	Number of pairs of glasses
$10 \leqslant x < 20$	5
$20 \leqslant x < 30$	20
$30 \leqslant x < 40$	23
$40 \leqslant x < 50$	52

(a) (i) Calculate an estimate for the mean depth of a lens. [4]

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(ii) In which group does the median lie? [1]

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(b) In the display of 100 pairs of glasses at *Davy's Opticians*, the mean depth of a lens is exactly the same as Marie's opticians.

Marie says,

"Considering only the mean depth of a lens, our display is **certain** to be very similar to the display in *Davy's Opticians*."

Explain why Marie is incorrect. [1]

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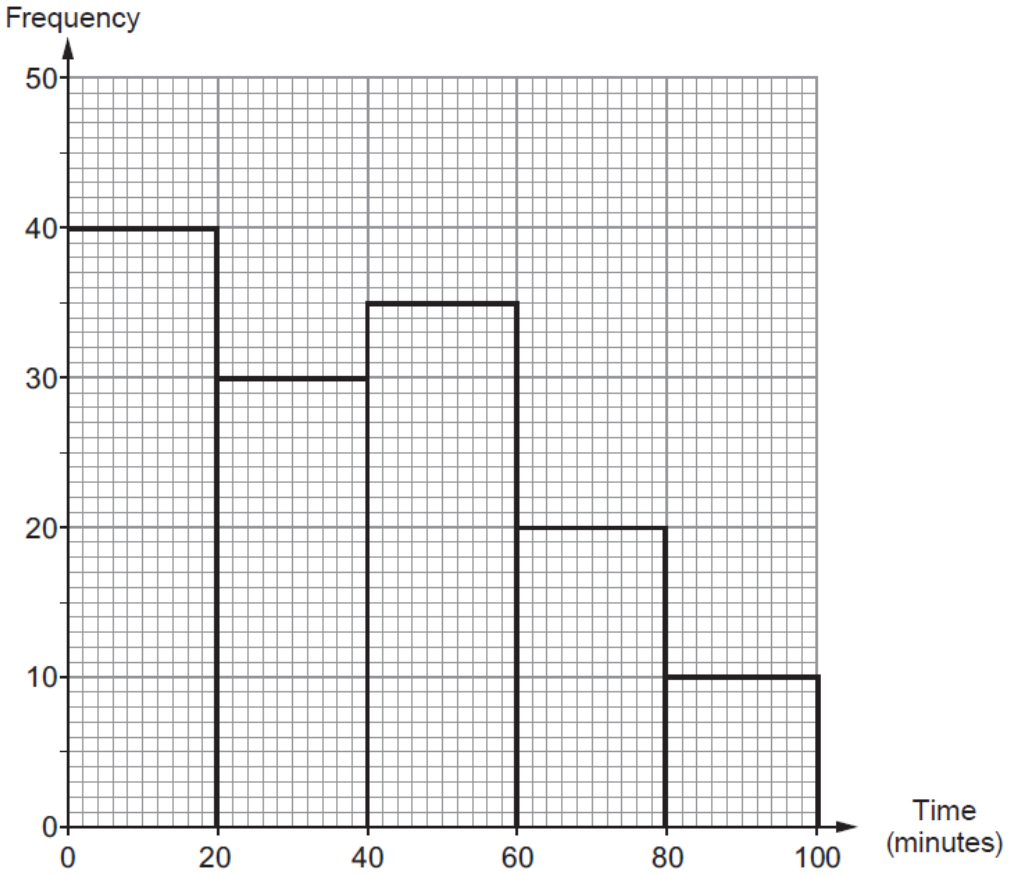
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Question taken from Eduqas examination paper 530004, June 2019

#8

Graham has recorded the time taken to score the first goal in each match for his favourite team, *The Whisper Wanderers*.
For a number of seasons he collected grouped data in a frequency table.
He then displayed this grouped data in a frequency diagram, as shown below.



(a) How many matches are represented in the frequency diagram? [1]

.....

.....

(b) (i) Calculate an estimate of the mean time taken for *The Whisper Wanderers* to score their first goal in these matches. [4]

(ii) How has any assumption you made in calculating your estimate of the mean time affected your answer? [1]

Question taken from Eduqas examination paper 530004, November 2018

#9

(a) In Queenbridge, the mean daily snowfall for a week was 1·6 cm.
If there had been 1 cm more snowfall on each day, what would the mean daily snowfall have been? [1]

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(b) In Sansburg, the snowfall for each of the first 10 days in January was measured.
The results are summarised in the table below.

Daily snowfall, s in cm	Number of days
$1{\cdot}5 \leqslant s < 2{\cdot}5$	4
$2{\cdot}5 \leqslant s < 3{\cdot}5$	2
$3{\cdot}5 \leqslant s < 4{\cdot}5$	1
$4{\cdot}5 \leqslant s < 5{\cdot}5$	0
$5{\cdot}5 \leqslant s < 6{\cdot}5$	3

Calculate an estimate for the mean daily snowfall for these 10 days. [4]

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(c) During the first 5 days of February, the mean snowfall in Awezell was 4·7 cm.
On 6th February the snowfall was 23·9 cm.

Calculate the mean snowfall for the first 6 days of February. [3]

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Question taken from Eduqas examination paper 530004, November 2019

Cumulative Frequency & Box Plots: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
#2	4	
#3	6	
#4	7	
#5	8	
#6	9	
#7	11	
#8	11	
Total	58	

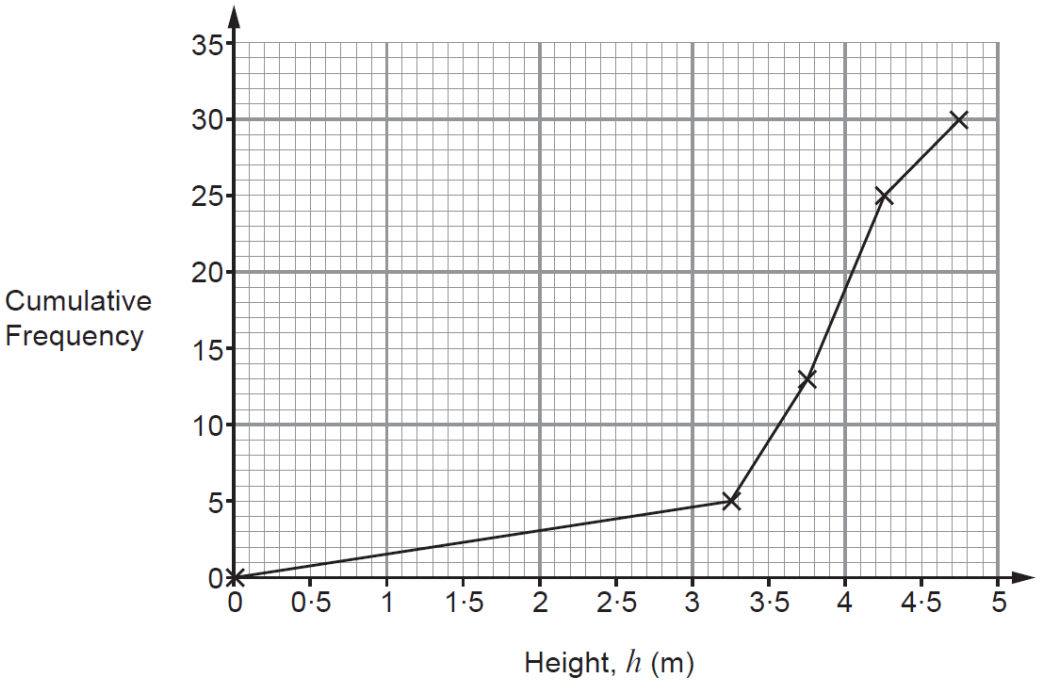
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#1

(a) Gracie has collected data about the heights of 30 giant sunflowers.
The table shows her results.

Height, h (m)	$3 < h \leqslant 3{\cdot}5$	$3{\cdot}5 < h \leqslant 4$	$4 < h \leqslant 4{\cdot}5$	$4{\cdot}5 < h \leqslant 5$
Frequency	5	8	12	5

Gracie attempts to draw a cumulative frequency diagram.



Make **two** different criticisms of Gracie's diagram. [2]

1. .....

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2. .....

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Question taken from Eduqas examination paper 530003, May 2023

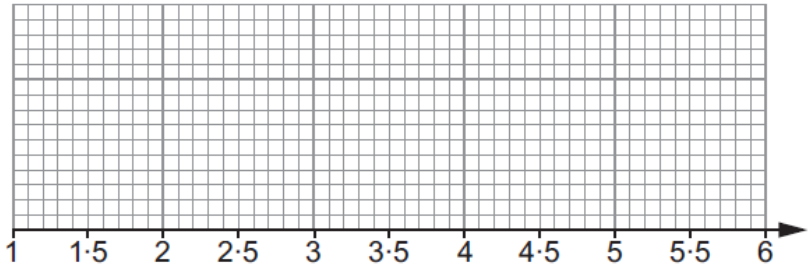
#2

Teddy and Ellie play computer games.
Each day they record how many hours they have spent playing computer games.

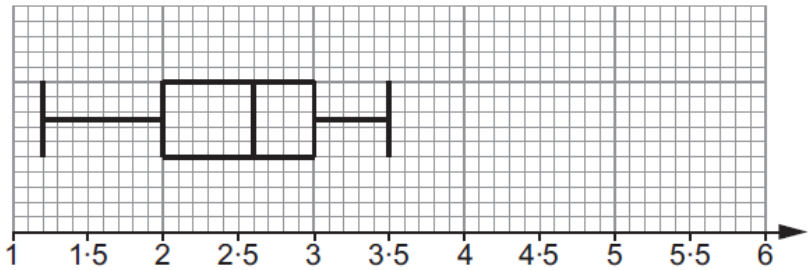
(a) Teddy keeps a record for 30 days.
The table shows a summary of his data.

Minimum	Maximum	Median	Upper Quartile	Interquartile range
1·5	5	4	4·5	2

Draw a box plot to represent Teddy's data on the grid below. [3]



(b) Here is a box plot of Ellie's data.



Is it possible to tell from the box plot the exact number of days for which Ellie recorded her times?

Yes ☐ No ☐

Explain how you decide. [1]

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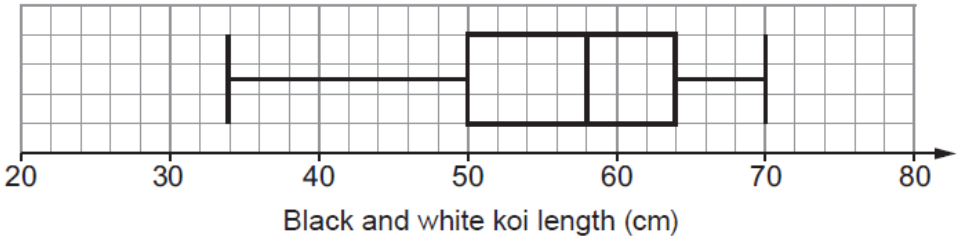
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Question taken from Eduqas examination paper 530003, June 2018

#3

A garden centre sells fish.
This box plot summarises data about the length, in cm, of a sample of 50 black and white Japanese koi they have for sale.



(a) What is the length of the longest black and white koi? [1]

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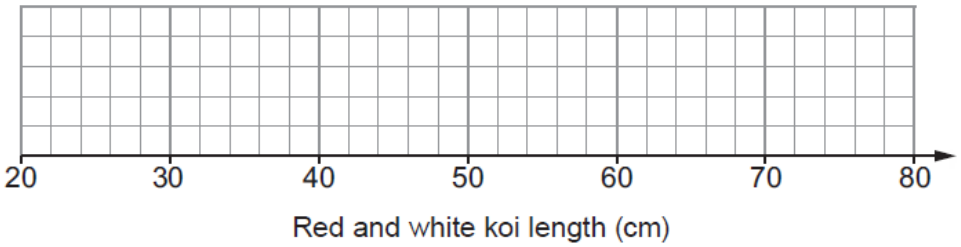
(b) What is the median length of the black and white koi? [1]

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(c) The garden centre also sells red and white Japanese koi.
The table shows information about the length, in cm, of a sample of 50 of the red and white koi they have for sale.

Minimum	Maximum	Lower Quartile	Median	Interquartile range
26	72	42	46	20

Draw a box plot to represent this data on the grid below. [3]



(d) The garden centre calls its koi 'mature' if they are more than 48 cm in length.
Which of the two samples of fish contains more 'mature' koi?

Black and white ☐ Red and white ☐

Explain how you decide. [1]

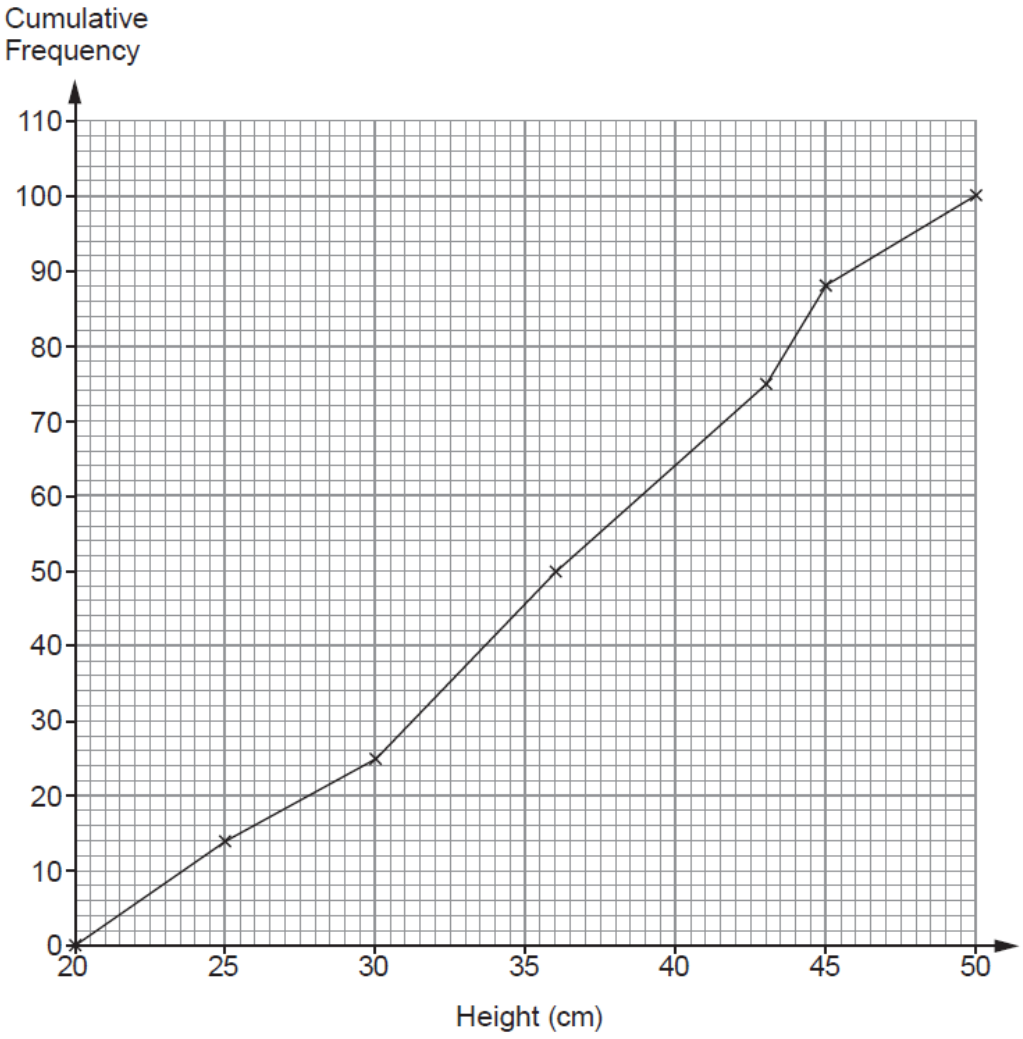
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Question taken from Eduqas examination paper 530003, June 2019

#4

(a) The diagram shows the distribution of the heights, in cm, of 100 *Firebird Marigold* plants.



(i) How many of these *Firebird Marigold* plants had a height of less than 25 cm? [1]

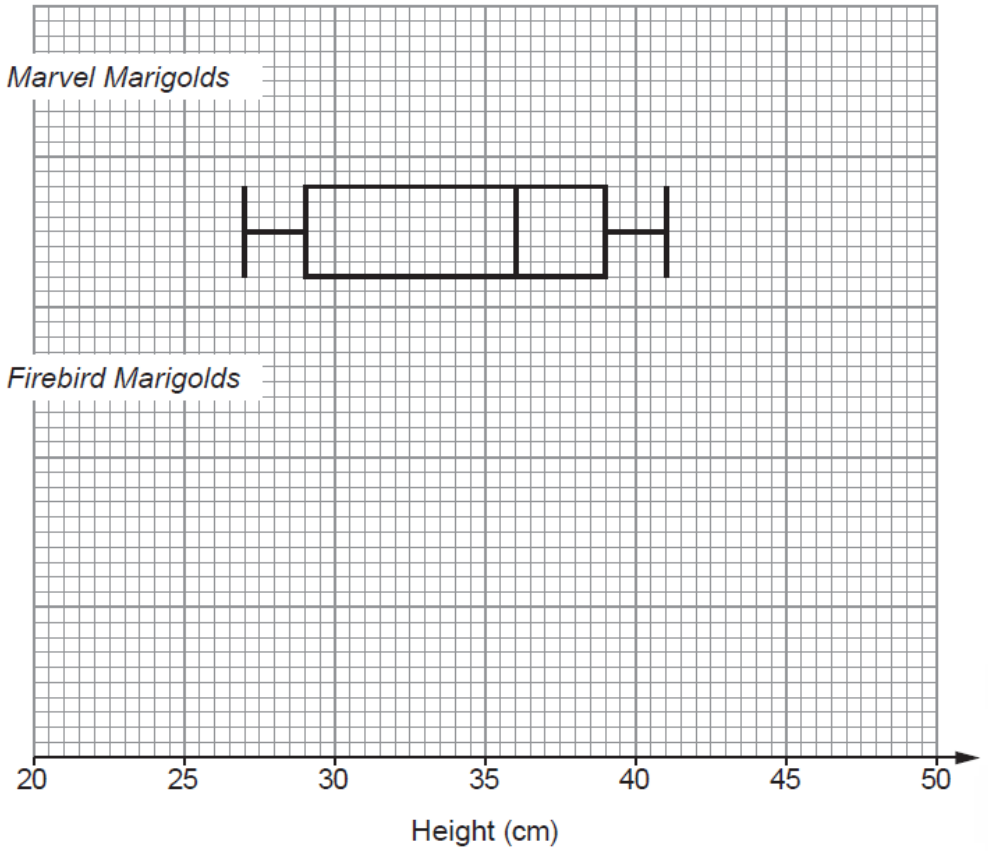
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(ii) Use the diagram to complete the table for these *Firebird Marigold* plants. [3]

Median	Lower Quartile	Upper Quartile	Inter-quartile Range

(b) This box plot shows the distribution of the heights, in cm, of 100 *Marvel Marigold* plants.



(i) The tallest *Firebird Marigold* plant had a height of 49 cm.
The range of the heights of the *Firebird Marigold* plants was exactly 27 cm.

Use this information and the information from part *(a)* to draw the box plot for the *Firebird Marigold* plants on the grid above. [2]

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(ii) Jules wants to buy one of these types of Marigold for her garden.
She wants as many as possible of her plants to be at least 30 cm tall.

Should Jules buy *Marvel Marigold* or *Firebird Marigold* plants?

Marvel Marigold ☐ *Firebird Marigold* ☐

Give a reason for your decision. [1]

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Question taken from Eduqas examination paper 530003, November 2020

#5

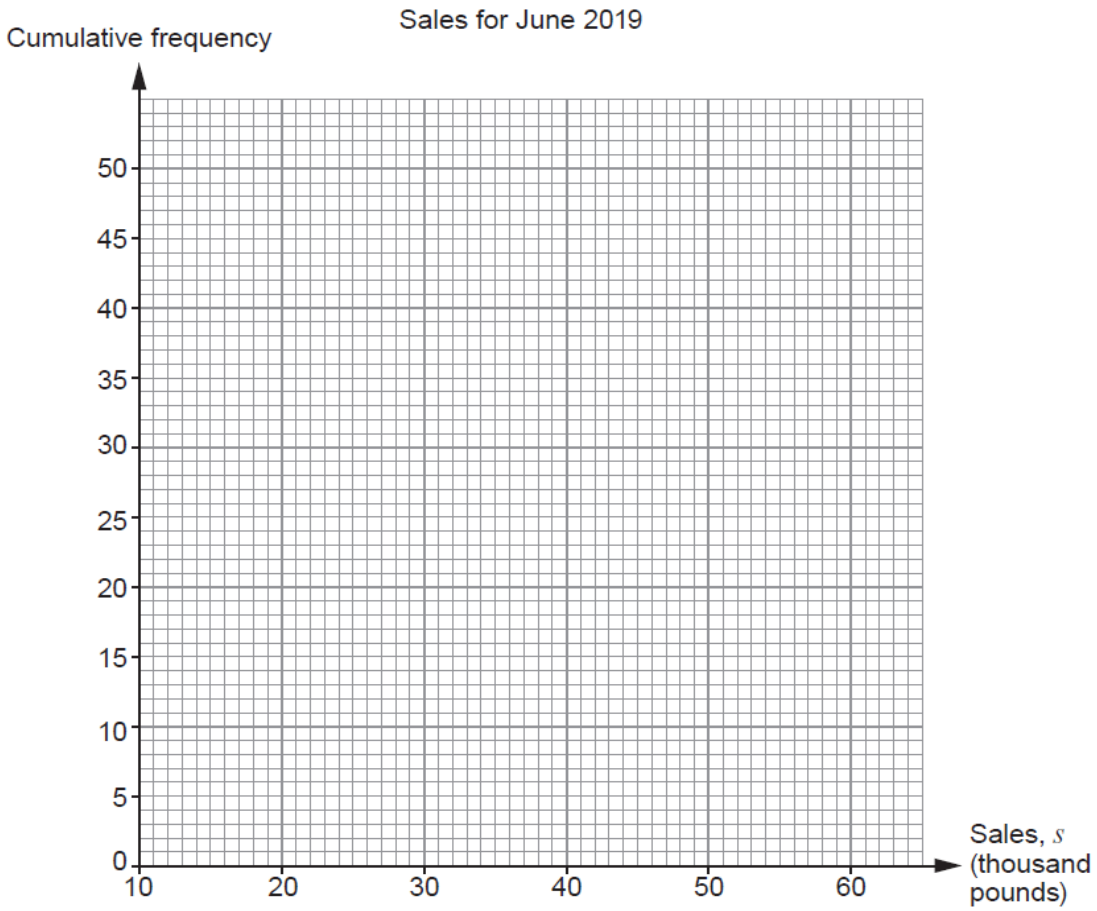
The owner of a double glazing company employs 50 salespeople.
For the month of June 2019, the total sales made by each salesperson is recorded in the table.

Sales, s (thousand pounds)	$10 < s \leqslant 20$	$20 < s \leqslant 30$	$30 < s \leqslant 40$	$40 < s \leqslant 50$	$50 < s \leqslant 60$
Frequency	0	8	15	18	9

(a) Complete the following cumulative frequency table. [1]

Sales, s (thousand pounds)	$s \leqslant 20$	$s \leqslant 30$	$s \leqslant 40$	$s \leqslant 50$	$s \leqslant 60$
Cumulative frequency	0	8			

(b) On the grid below, draw a cumulative frequency diagram to show these results. [3]



(c) The owner gives monthly bonuses to the salespeople who have the highest value sales.

	Bonus
Top 10% of salespeople	Gold
Next 20% of salespeople	Silver

(i) Use your graph to find the minimum value of sales needed to earn each bonus in June 2019. [2]

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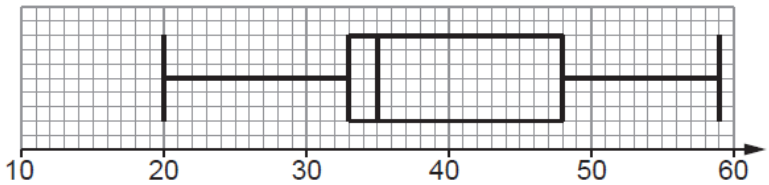
Gold bonus £ ..... Silver bonus £ .....

(ii) Explain why your answers to part *(c)*(i) may not be accurate. [1]

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(d) The box plot shows summary statistics for the month of September 2019.



The owner is considering closing the business for 2 days of staff training next year. This can take place in either June or September.

Using the sales data from 2019, should the owner choose to train her staff in June or September?

June ☐ September ☐

Show how you decide. [1]

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Question taken from Eduqas examination paper 530003, November 2021

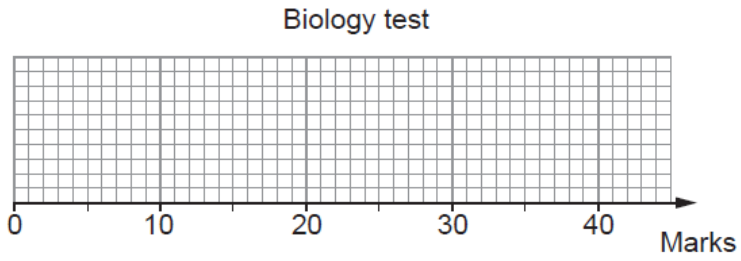
#6

280 students took tests in each of the three subjects, Biology, Chemistry and Physics. Each test consisted of questions worth a total of 40 marks.

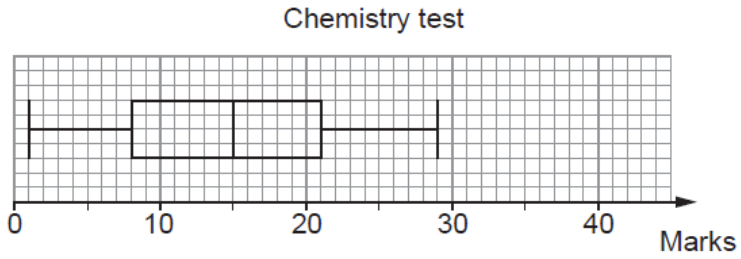
(a) The following table shows a summary of the Biology test data.

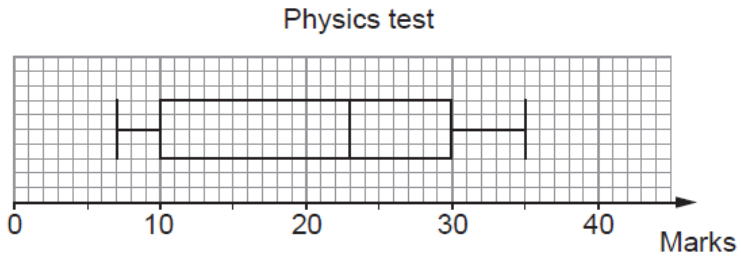
Lowest mark	Highest mark	Lower quartile	Median	Interquartile range
12	40	22	29	13

On the grid below, draw a box plot to represent this data. [3]



(b) Two box plots have been drawn representing the test data for Chemistry and Physics.





(i) Calculate the number of students that were awarded 10 or more marks in Physics. [2]

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(ii) Two teachers disagree over the spread of the marks.

One teacher states that the **spread** of marks is the same for **all three** tests.
The other teacher states that the **spread** of the marks is the same in **only two** of the tests.

Explain why **both teachers** are correct.
You must give values to justify your answer. [3]

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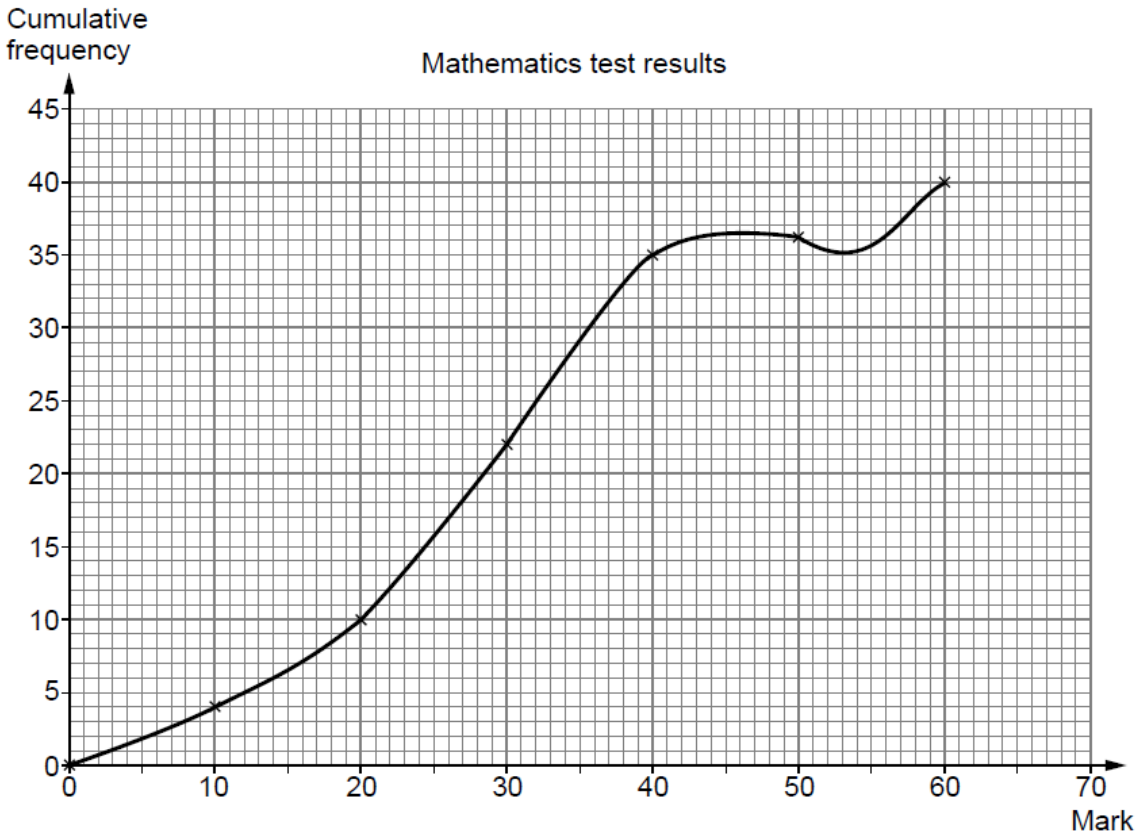
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(c) A **different** set of students sat a mathematics test. The test was out of 60 marks.
The results obtained were recorded in a table and a cumulative frequency graph was drawn.

Mark (m)	Cumulative Frequency
$0 < m \leqslant 10$	4
$0 < m \leqslant 20$	10
$0 < m \leqslant 30$	22
$0 < m \leqslant 40$	35
$0 < m \leqslant 50$	36
$0 < m \leqslant 60$	40



Criticise the above graph. [1]

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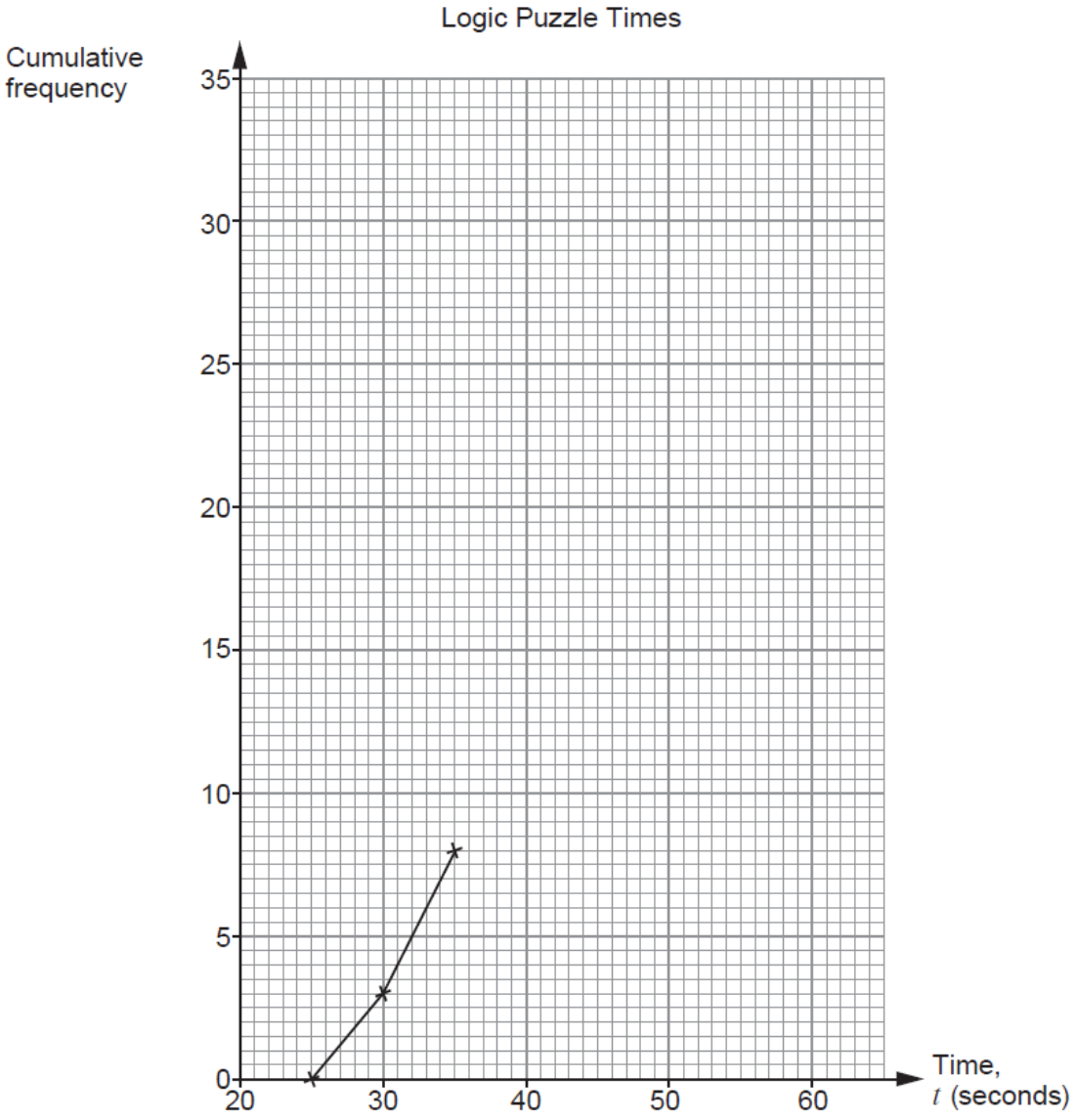
Question taken from Eduqas examination paper 530003, November 2024

#7

The table shows a summary of the time, in seconds, it takes each of 32 people to complete a logic puzzle.

Time, t (seconds)	$t \leqslant 25$	$t \leqslant 30$	$t \leqslant 35$	$t \leqslant 40$	$t \leqslant 45$	$t \leqslant 50$	$t \leqslant 55$	$t \leqslant 60$
Cumulative frequency	0	3	8	16	21	24	29	32

(a) Complete the cumulative frequency diagram below to show these results. [2]



(b) (i) How many people took more than 40 but not more than 50 seconds to complete the puzzle? [1]

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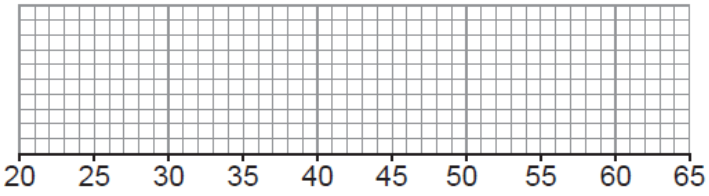
(ii) Complete the inequality to show the modal class. [1]

..... $< t \leqslant$ .....

(c) Eddie uses the data from part *(a)* to obtain estimates and draw a box plot.

He also knows that the fastest time is 26 seconds.
Eddie also **assumes** that the slowest time is 60 seconds.

(i) Draw Eddie's box plot. [4]



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(ii) Explain why Eddie's assumption may not be correct. [1]

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(iii) Eddie's assumption is not actually correct.
What effect does this have on each of the range and the interquartile range? [2]

Effect on the range: .....

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Effect on the interquartile range: .....

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Question taken from Eduqas examination paper 530003, November 2019

#8

Sita is investigating the popularity of two social media websites, A and B.

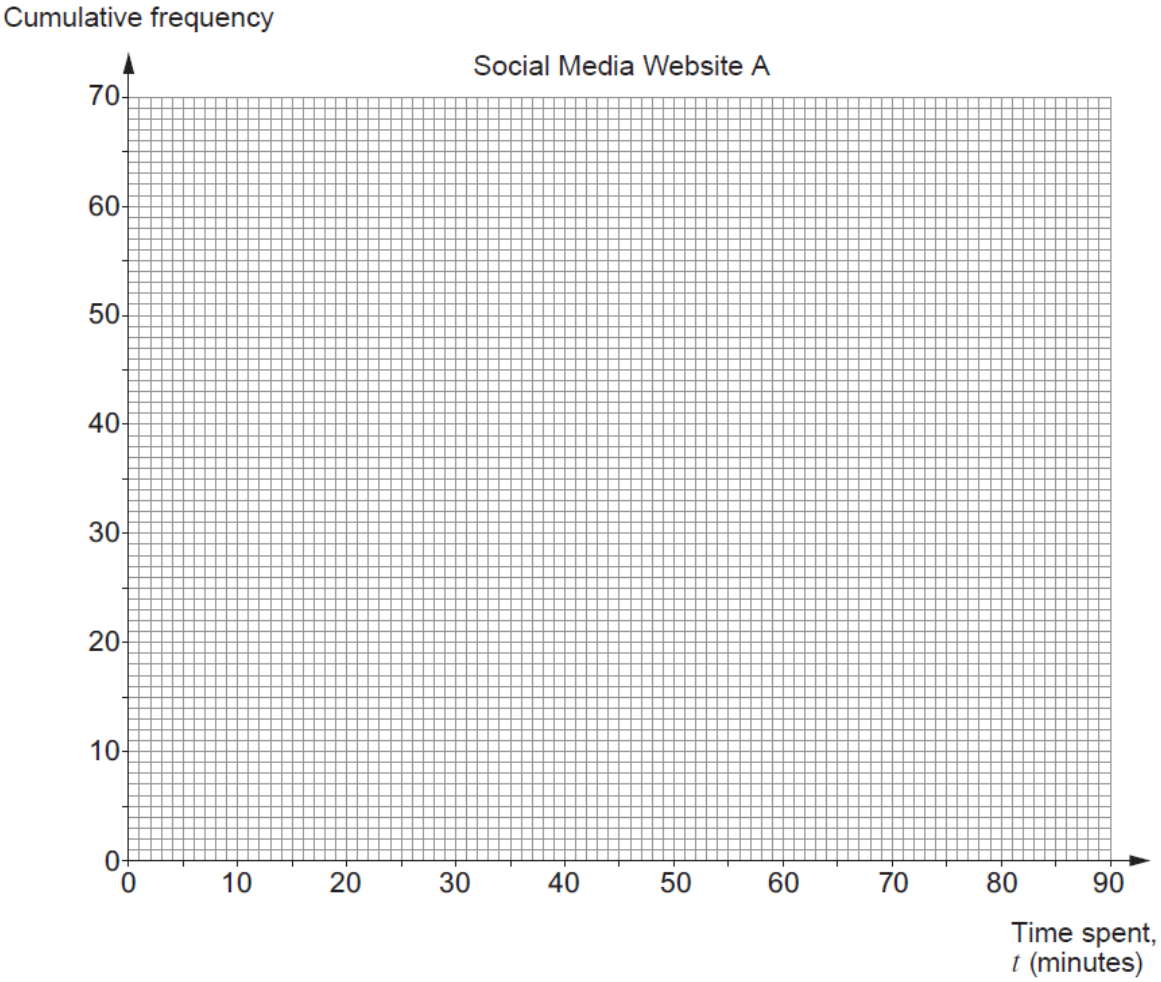
She asked 60 technology students how much time they each spent using social media website A yesterday.
The table summarises the data she collected.

Time spent, t (minutes)	$t \leqslant 20$	$t \leqslant 30$	$t \leqslant 40$	$t \leqslant 50$	$t \leqslant 60$	$t \leqslant 70$	$t \leqslant 80$
Cumulative frequency	0	5	25	45	52	58	60

(a) How many students spent more than 60 minutes using social media website A? [1]

.....

(b) Draw a cumulative frequency diagram to represent Sita's information. [3]



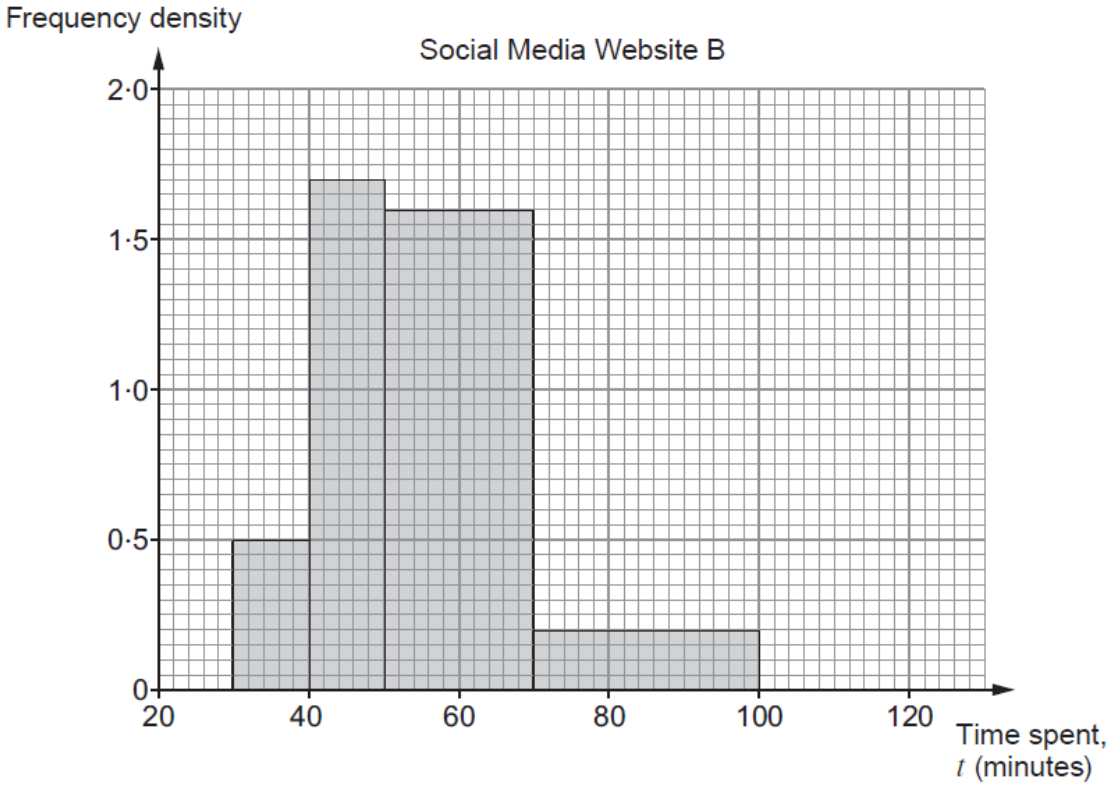
(c) Use your diagram to find an estimate of the median time and the interquartile range of the times the students spent using social media website A. [3]

.....

.....

Median ..... minutes Interquartile range ..... minutes

(d) Sita asked the same 60 technology students how much time they each spent using social media website B yesterday. She used her data to draw the histogram shown below.



(i) Calculate an estimate for the difference between the number of students who use social media website B for more than 60 minutes and those who use social media website A for more than 60 minutes. [3]

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(ii) Sita uses her results to state which social media website is more popular.
Is her conclusion likely to be reliable?
Explain how you decide. [1]

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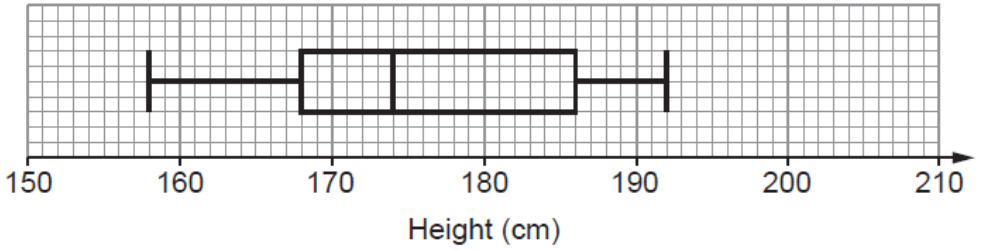
Question taken from Eduqas examination paper 530003, November 2018

Cumulative Frequency & Box Plots: Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	5	
#3	6	
#4	7	
#5	10	
Total	31	

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#1 The box plot summarises the heights, in cm, of a class of students.



Use the box plot to complete the table. [3]

Range	Median	Lower quartile	Upper quartile	Interquartile range

.....

.....

Question taken from Eduqas examination paper 530004, June 2023

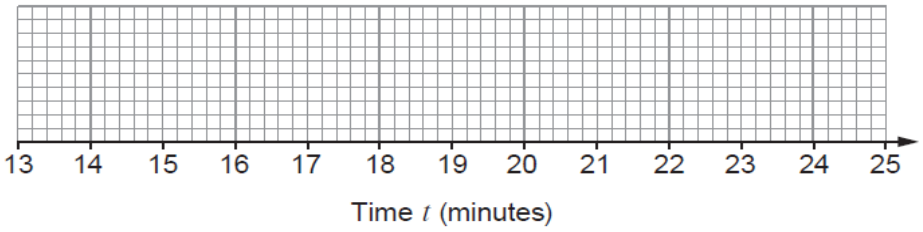
#2

Two groups of people, *A* and *B*, take part in a fun run.
Everyone in the groups completes the run.

The table gives a summary of the times, t minutes, taken by group *A*.

Minimum	Maximum	Median	Lower Quartile	Inter-quartile range
15·2	23·2	19·4	16·8	4·2

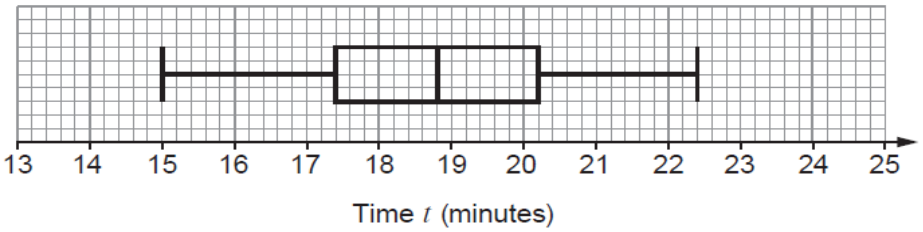
(a) On the grid below, draw a box plot to represent this data. [3]



.....

.....

(b) The box plot below gives a summary of the times, t minutes, taken by group *B*.



Marcie makes two statements using information from the box plots.
Are Marcie's statements correct?
Explain how you decide.

(i) "On average, runners in group *B* ran faster than runners in group *A*." [1]

Correct ☐ Not correct ☐

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(ii) "There is a greater proportion of runners who took less than 17 minutes in group *B*." [1]

Correct ☐ Not correct ☐

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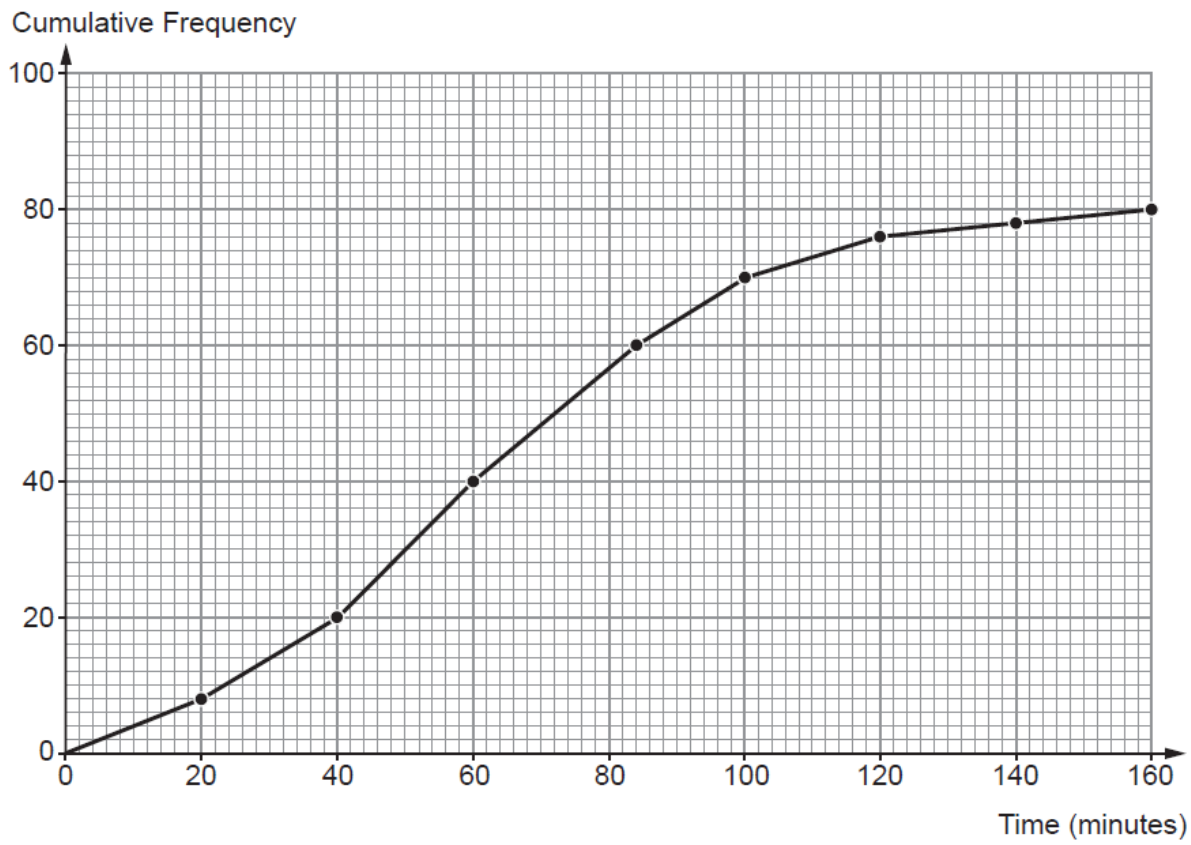
Question taken from Eduqas examination paper 530004, November 2022

#3

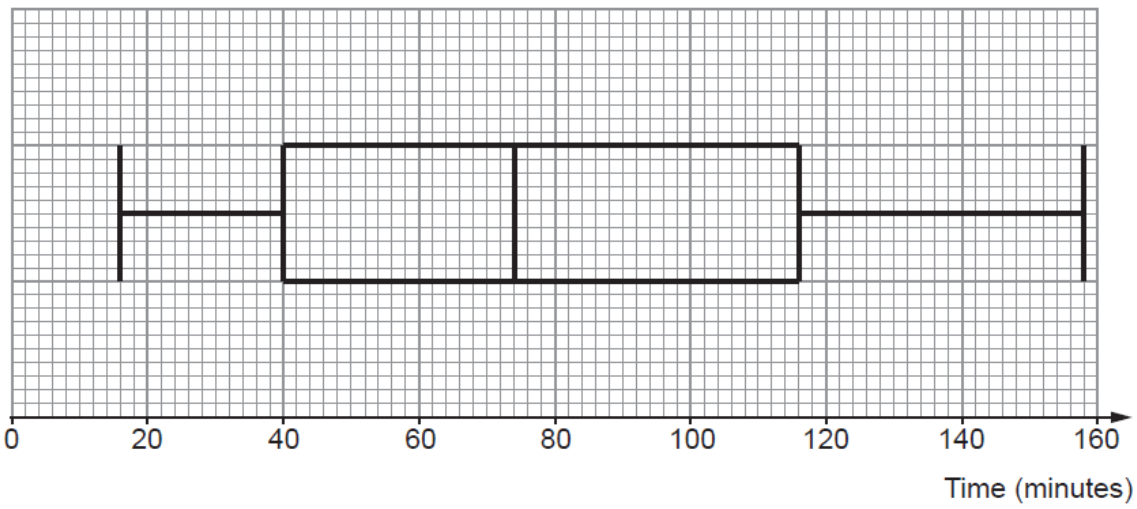
A video game company investigated how long, in minutes, one group of 10-year-old students and one group of 14-year-old students spent playing video games last Wednesday evening.

Diagrams displaying the results for each age group are shown below.

10-year-old students



14-year-old students



(a) Lewis says,

"14-year-olds spend longer, on average, playing video games than 10-year-olds."

Is Lewis correct?

Yes ☐ No ☐

Use information from the diagrams to justify your answer. [1]

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(b) Complete the following sentences using information from the diagrams.

(i) The percentage of **14-year-old** students that spent less than 40 minutes playing video games last Wednesday evening was ..... %. [1]

(ii) The percentage of **10-year-old** students that spent more than 120 minutes playing video games last Wednesday evening was ..... %. [2]

.....

.....

(c) Compare the inter-quartile range of the times each age group spent playing video games last Wednesday evening.
What conclusions can you draw about the length of time 10-year-olds and 14-year-olds spent playing video games last Wednesday evening? [2]

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Question taken from Eduqas examination paper 530004, June 2024

#4

As part of an experiment two groups of people, *A* and *B*, took the same general knowledge test.

The test had a maximum of 100 marks.

(a) The first two columns of the table summarise the results of the test for the 45 people in *Group A*.

Mark	Frequency	Cumulative Frequency
$0 < p \leqslant 20$	0	0
$20 < p \leqslant 40$	3	3
$40 < p \leqslant 60$	20	
$60 < p \leqslant 80$	15	
$80 < p \leqslant 100$	7	

(i) Complete the cumulative frequency column. [1]

.....

.....

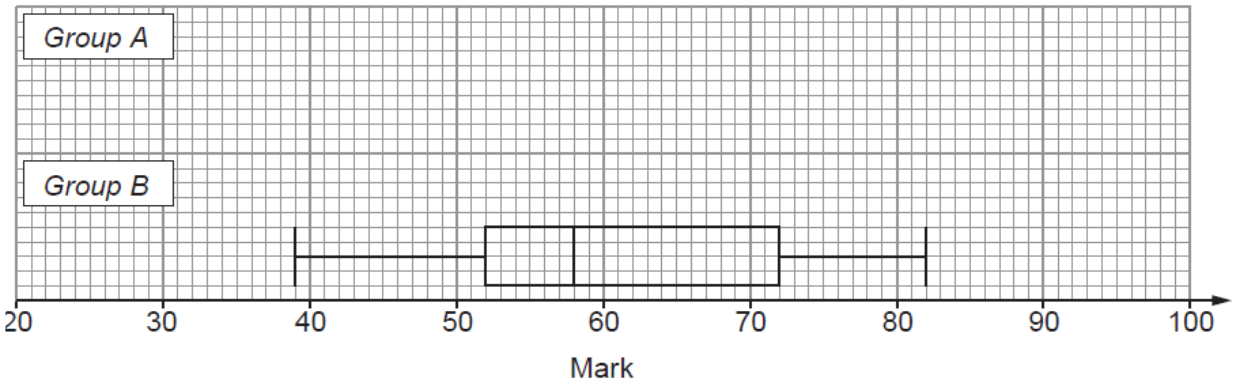
.....

(ii) Explain why 60 is a reasonable estimate of the median mark. [1]

.....

.....

(b) This box plot shows the distribution of the marks of the people in *Group B*.



(i) For the people in *Group A*:

Minimum mark	Range	Lower Quartile	Median	Upper Quartile
23	76	49	60	75

Draw the box plot for *Group A* on the grid above. [3]

(ii) Make **two** comments to compare the results of *Group A* and *Group B*.
One comment must include an appropriate average.
The other comment must include a measure of spread. [2]

Comment 1 .....

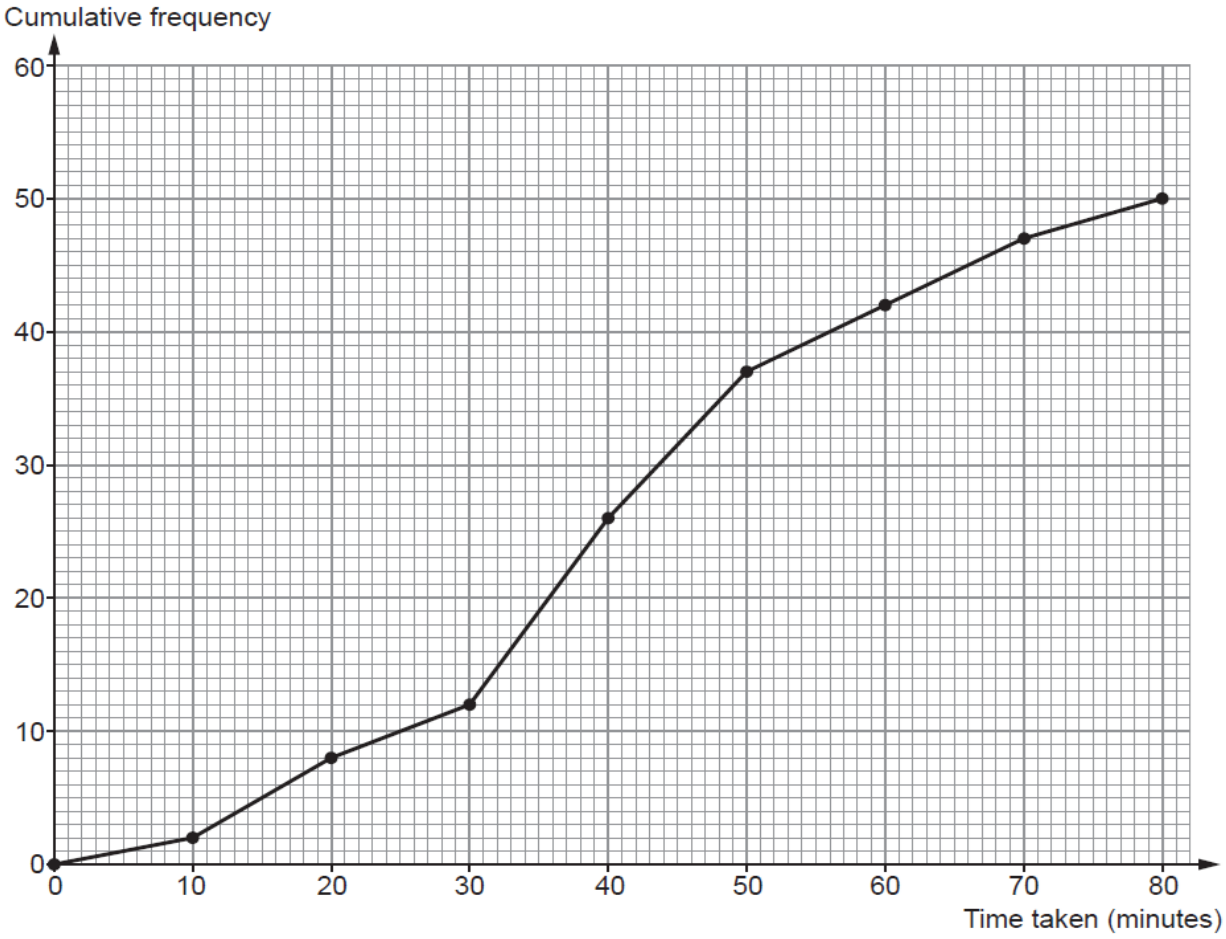
Comment 2 .....

Question taken from Eduqas examination paper 530004, June 2022

#5

The same home learning task was given to 50 Year 7 pupils in school A and 50 Year 7 pupils in school B.
The length of time, in minutes, each pupil took to complete the task was recorded.

(a) The results for the pupils from school A are shown on the cumulative frequency diagram below.



Use the cumulative frequency diagram to answer the following questions about the pupils in school A.

(i) What is the median time taken to complete the task? [1]

.....

Median ..... minutes

(ii) Calculate the inter-quartile range of the times taken to complete the task. [2]

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Inter-quartile range ..... minutes

(iii) What percentage of pupils took longer than 62 minutes to complete the home learning task? [2]

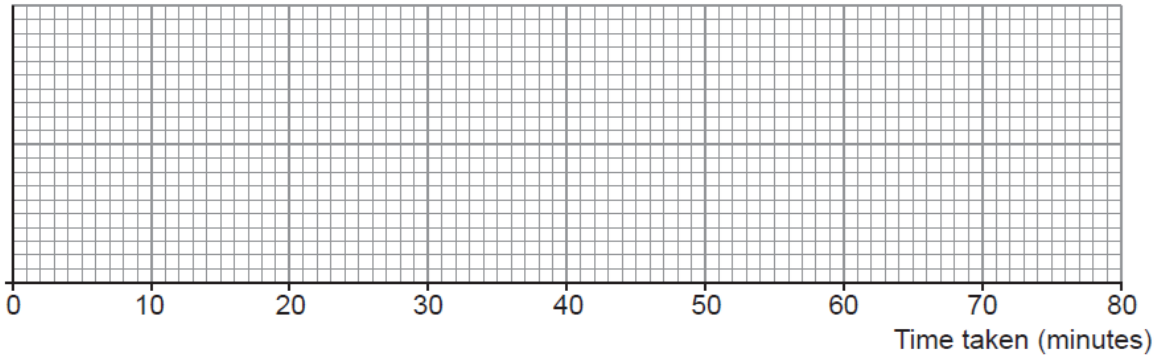
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(b) A summary of the results for the pupils in school B is shown in the table below.

Least time	12 minutes
Lower quartile	31 minutes
Median	45 minutes
Inter-quartile range	24 minutes
Greatest time	1 hour 5 minutes

Draw a box plot to display the results for school B. [3]



(c) Make **two** comments to compare the results of school A and school B.
One comment must include an appropriate average.
The other comment must include a measure of spread. [2]

Comment 1

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Comment 2

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Question taken from Eduqas examination paper 530004, November 2023

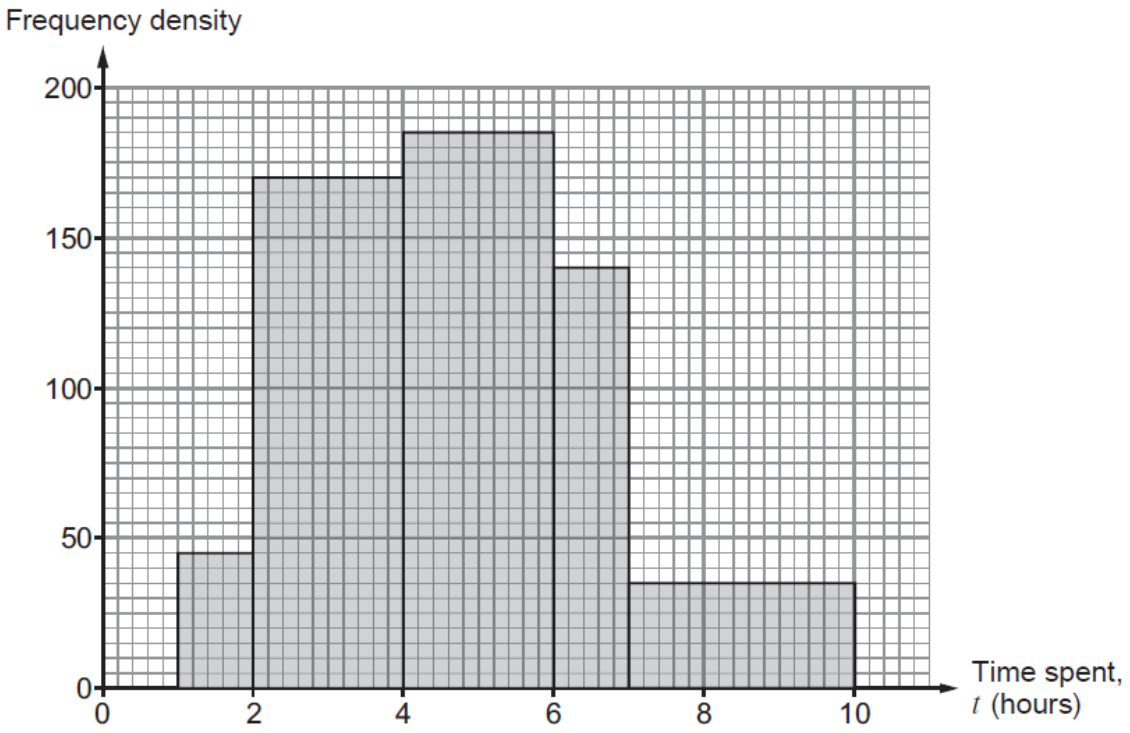
Histograms: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	5	
#3	6	
#4	7	
#5	9	
#6	9	
Total	39	

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#1

The histogram summarises the time spent by 1000 visitors at a flower show.



Calculate the percentage of visitors who spent 6 or more hours at the flower show. [3]

Question taken from Eduqas examination paper 530003, June 2019

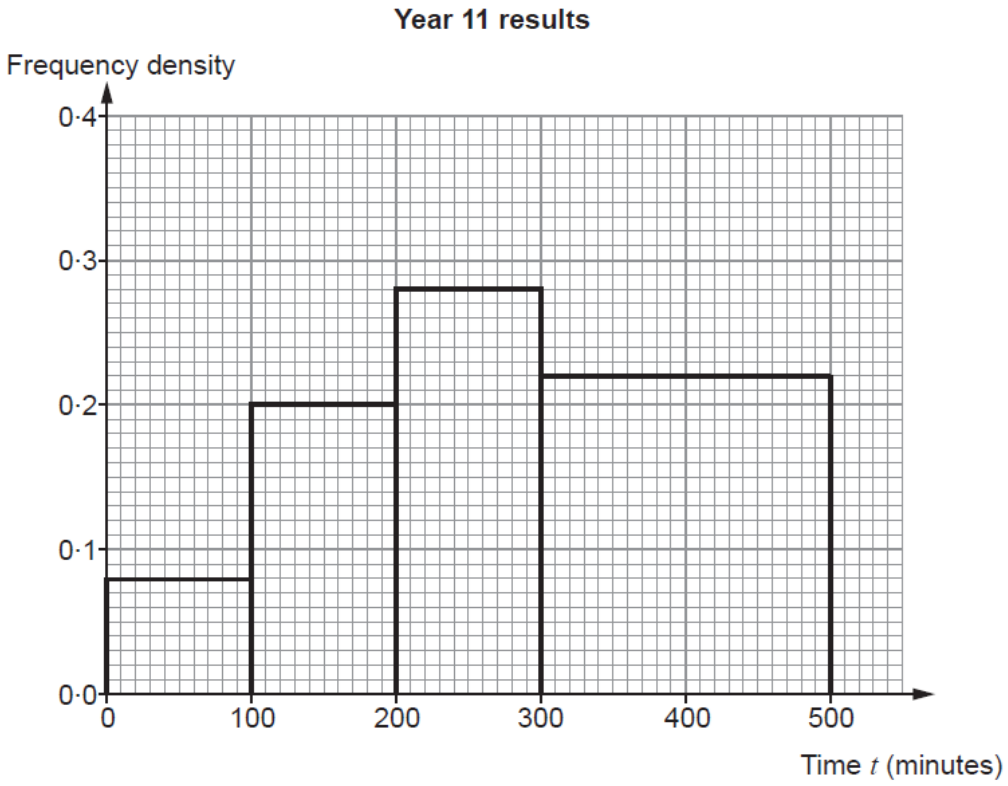
#2

Alice is investigating how much time, in minutes, pupils at her school spend on their mobile phones.
She asks 100 students in Year 11 and 100 students in Year 7 to record how much time they each spend on their mobile phones on a Monday.

(a) The results for Year 11 are shown in the table below.

Time t (minutes)	$0 \leqslant t < 50$	$50 \leqslant t < 100$	$100 \leqslant t < 200$	$200 \leqslant t < 300$	$300 \leqslant t < 400$	$400 \leqslant t < 500$
Number of students	3	5	20	28	30	14

Alice displays her results in the histogram shown below.



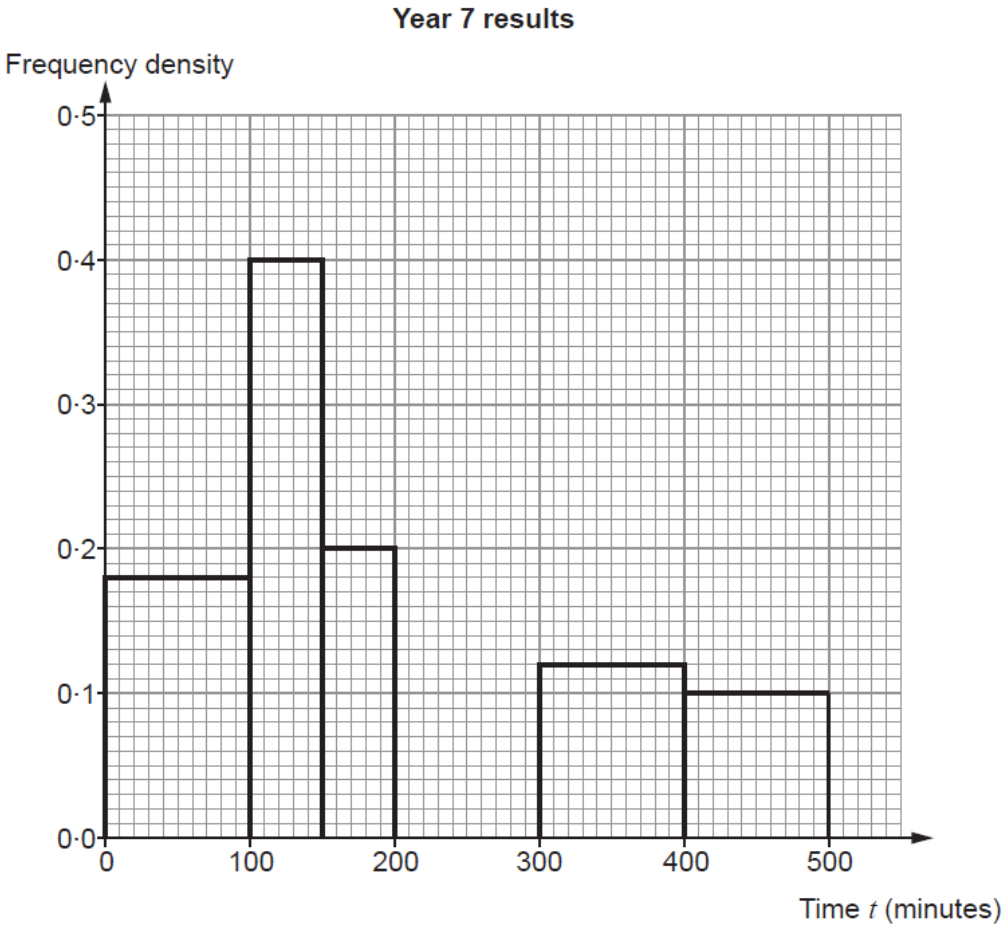
Give **one** criticism of Alice's histogram. [1]

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(b) Alice's histogram showing the results for the 100 Year 7 students is shown below.
The group with time $200 \leqslant t < 300$ is missing.



Complete the histogram.
You must show all your working. [3]

(c) Make **one** comparison between the amount of time spent on their mobile phones by **all** the students in Year 11 and **all** the students in Year 7. [1]

Question taken from Eduqas examination paper 530003, November 2023

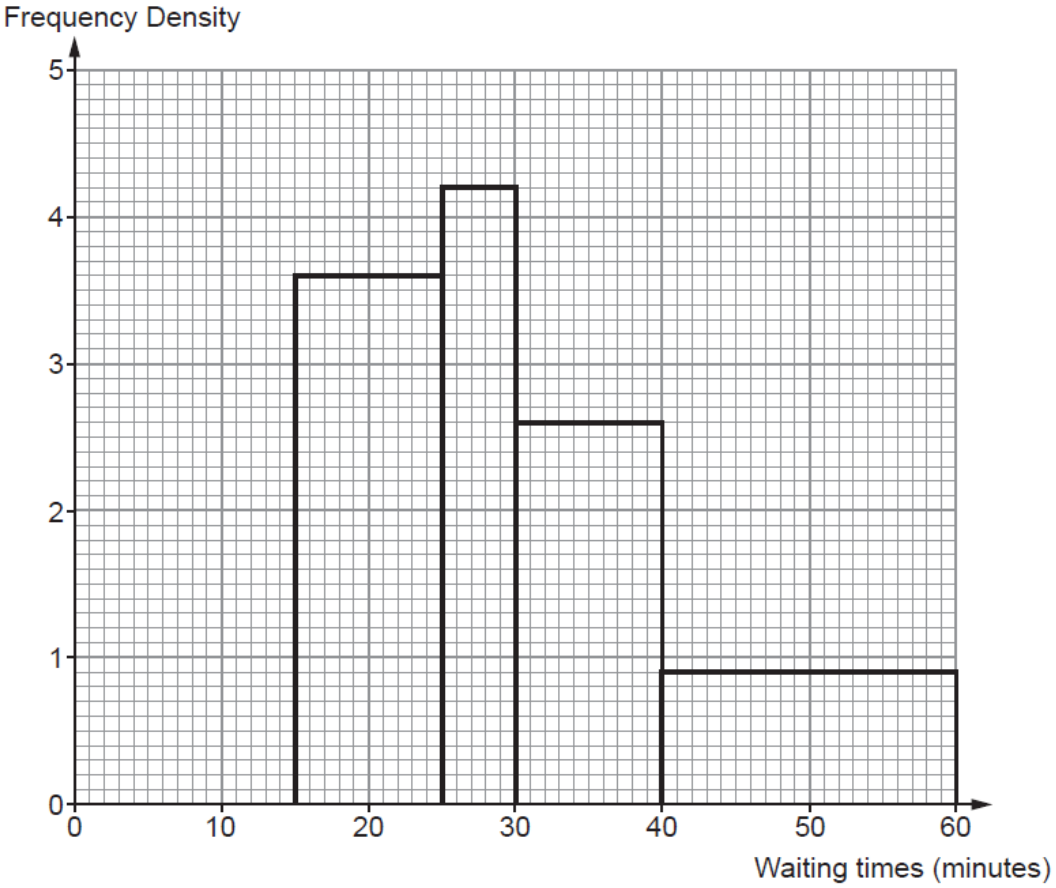
#3

(b) On the opening night of the restaurant, the time that each customer had to wait for their meal was recorded.

It is known that:

- 110 customers ate a meal at the restaurant
- 9 customers had to wait between 0 and 15 minutes
- every customer waited less than 1 hour.

(i) Complete the histogram below. [2]



(ii) Calculate the **percentage** of the 110 customers who had to wait longer than 30 minutes for their meal. [4]

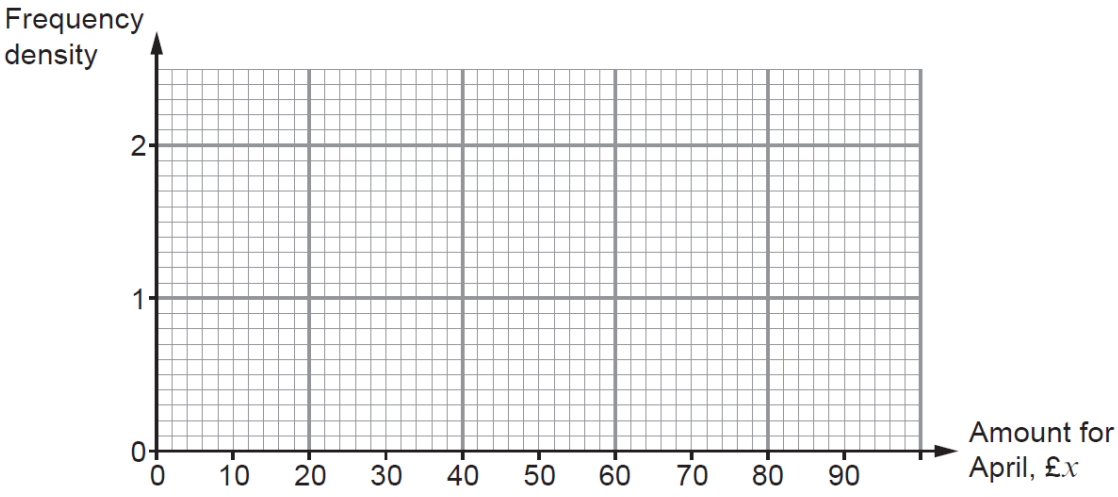
Question taken from Eduqas examination paper 530003, May 2024

#4

(b) Gracie also collects data about the amount of money each of a group of 40 gardeners spent on their gardens during the months of April and May.
The table shows the data for April.

Amount for April, (£x)	$0 < x \leqslant 30$	$30 < x \leqslant 40$	$40 < x \leqslant 50$	$50 < x \leqslant 60$	$60 < x \leqslant 80$
Frequency	6	9	12	5	8

(i) Draw a histogram to represent the data for April. [4]



.....

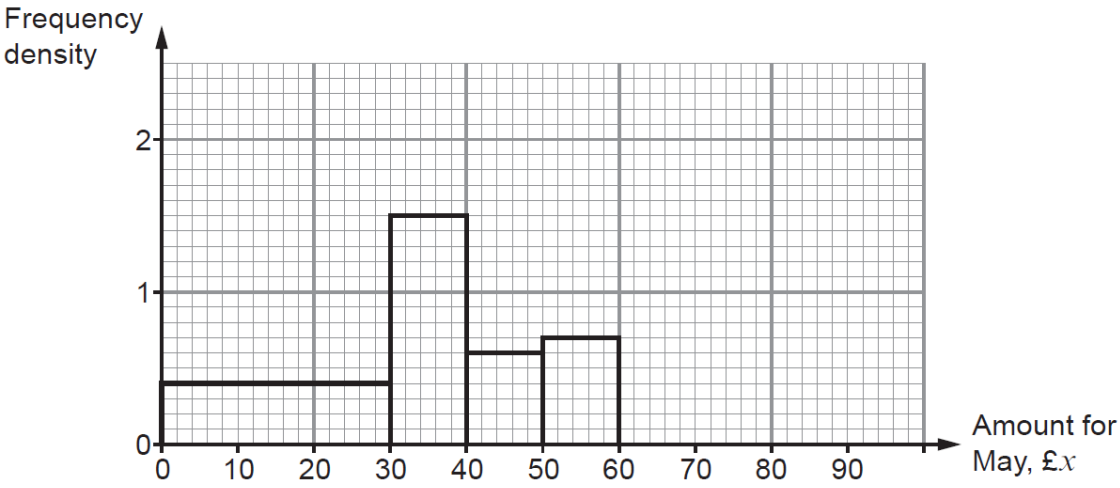
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(ii) The histogram below represents the data for May.



Calculate an estimate of how many more of the 40 gardeners spent £45 or less in May than spent £45 or less in April?
You must show all your working. [3]

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Question taken from Eduqas examination paper 530003, May 2023

#5

Brian and Yvonne are gardeners.
They each have an orchard of fully-grown apple trees.

(a) The table shows information about the height, in cm, of Yvonne's 43 apple trees on 1st September.

Tree height, h (cm)	$200 < h \leqslant 250$	$250 < h \leqslant 260$	$260 < h \leqslant 290$	$290 < h \leqslant 300$	$300 < h \leqslant 320$
Frequency	5	8	12	13	5
Frequency density					

(i) Complete the frequency density row in the table above. [2]

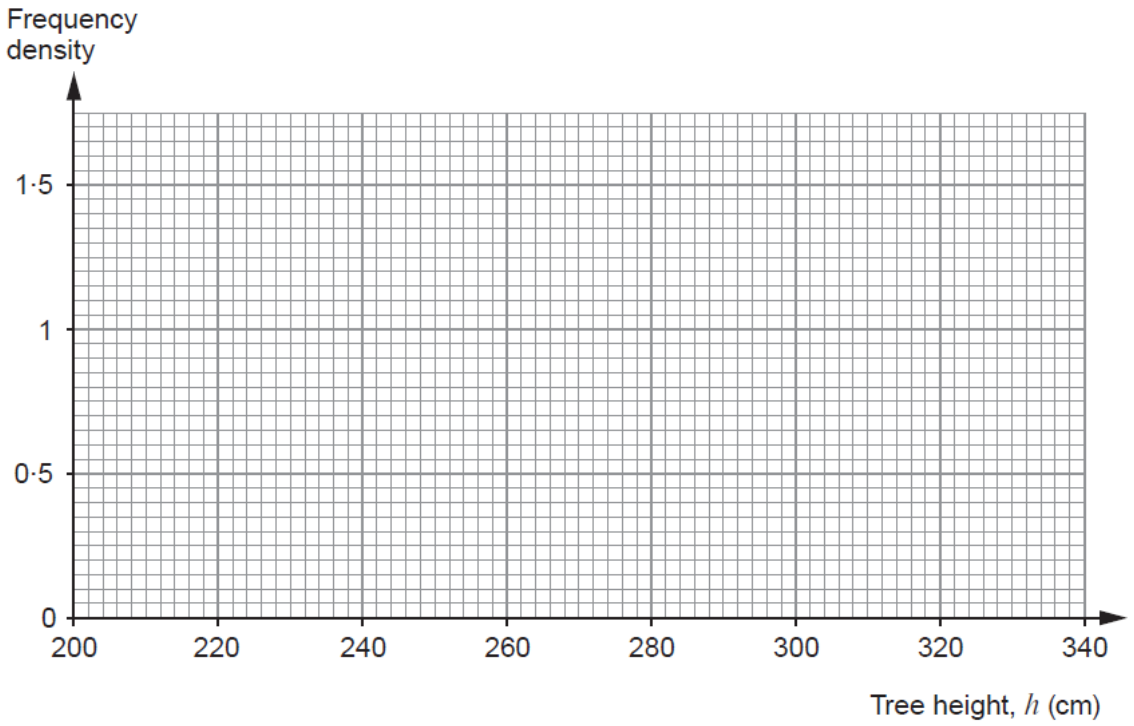
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(ii) Draw a histogram to illustrate the data in the table. [2]



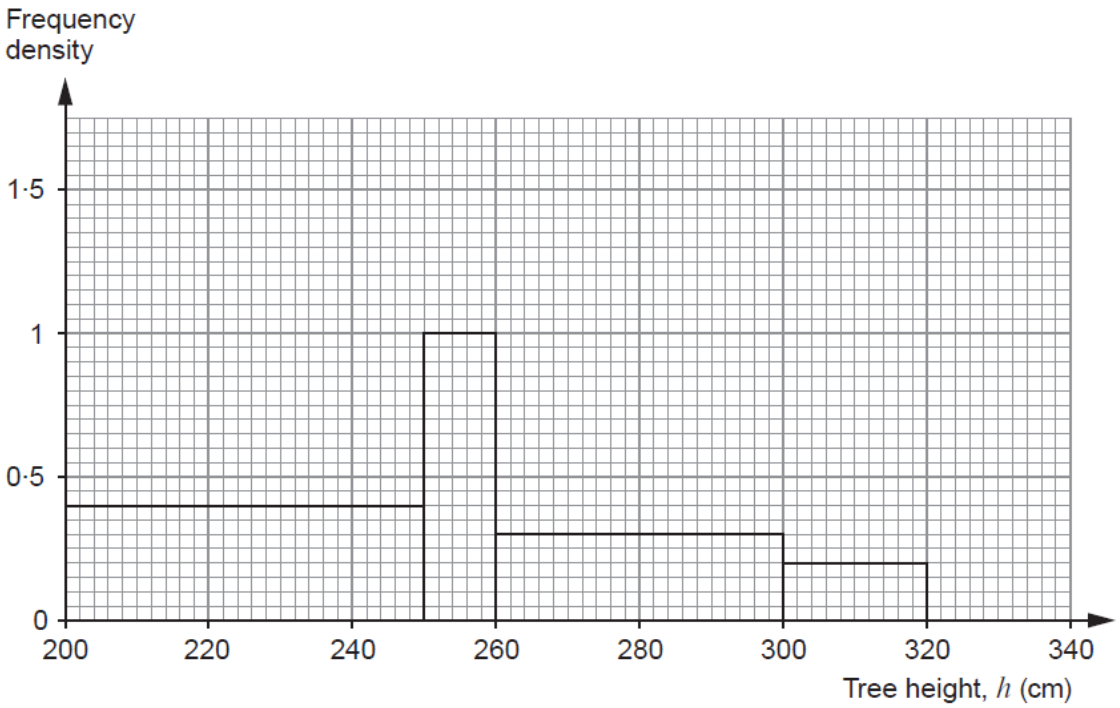
(iii) Calculate an estimate of the probability that an apple tree has a height of less than 270 cm. [2]

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(b) This histogram shows the heights of the apple trees in Brian's orchard on 1st September.



How many apple trees are in Brian's orchard? [2]

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(c) One of the gardeners says,

"I prefer to grow shorter apple trees as the fruit is easier to pick."

Which person is this likely to be?
You must justify your answer. [1]

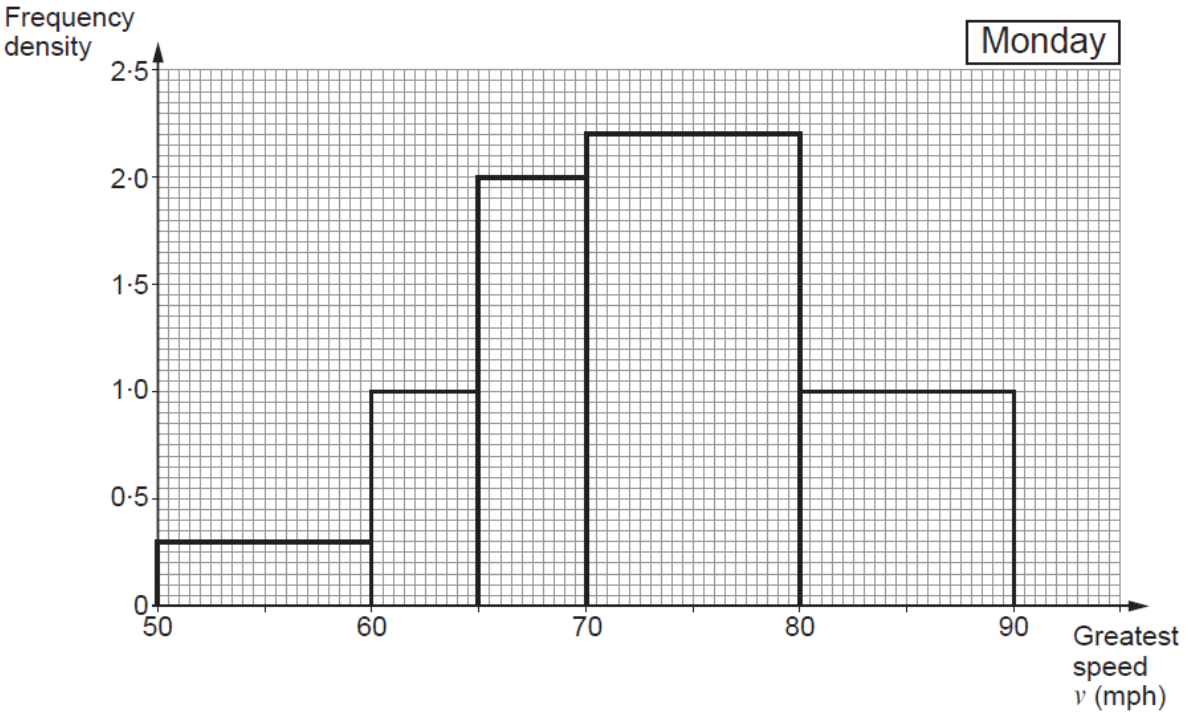
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Question taken from Eduqas examination paper 530003, May 2022

#6 The histogram below represents the greatest speed, v mph, of a car when driven by 50 drivers on a section of racetrack on Monday.

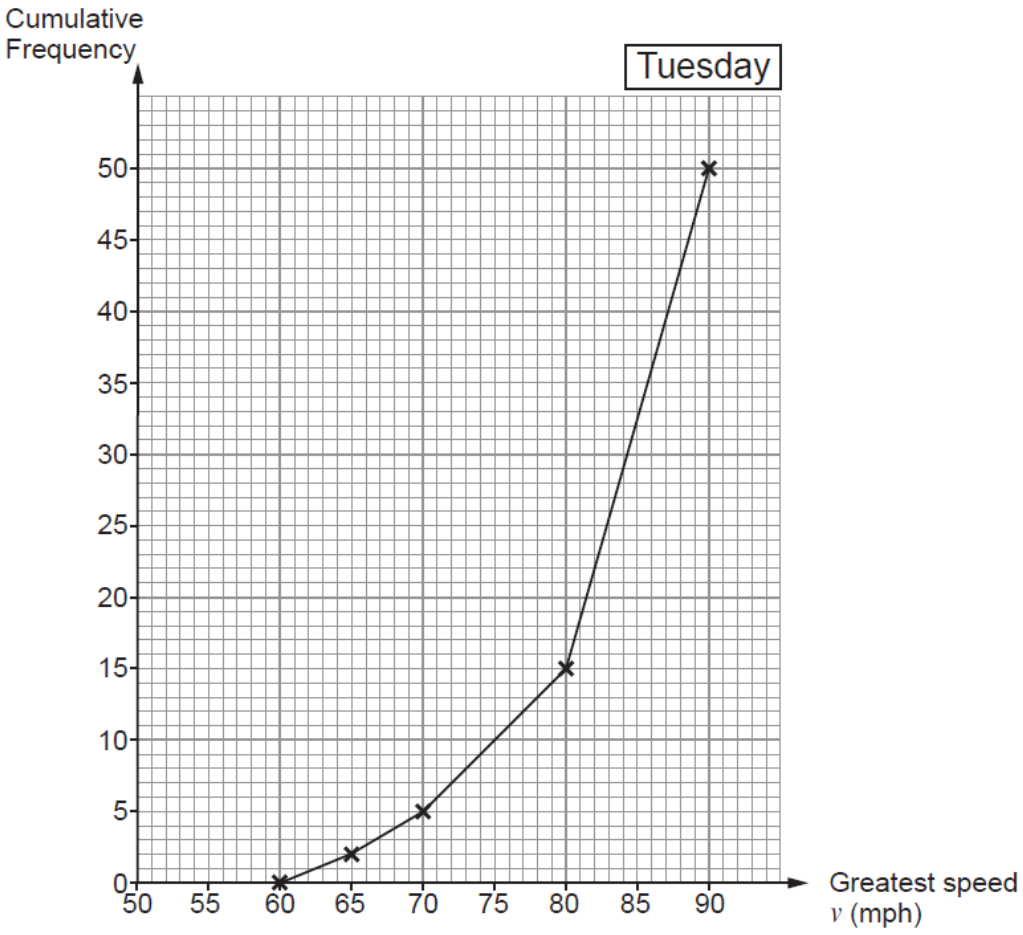


(a) Calculate an estimate of the percentage of the 50 drivers who drove at a greatest speed of 75 mph or more on this section of racetrack. [3]

(b) Use the histogram to complete this cumulative frequency table. [2]

Greatest speed, v (mph)	$v \leqslant 50$	$v \leqslant 60$	$v \leqslant 65$	$v \leqslant 70$	$v \leqslant 80$	$v \leqslant 90$
Cumulative frequency	0					50

(c) The cumulative frequency diagram below represents the greatest speed, v mph, of the same car when driven by 50 different drivers on the same section of racetrack on Tuesday.



(i) On the grid above, draw the cumulative frequency diagram to represent the results of Monday's drivers. [2]

(ii) On one of the days, many of the drivers were racing drivers.

On which day was this likely to be?
Give numerical evidence and explain your decision. [2]

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Question taken from Eduqas examination paper 530003, November 2022

Histograms: Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	7	
#3	8	
Total	18	

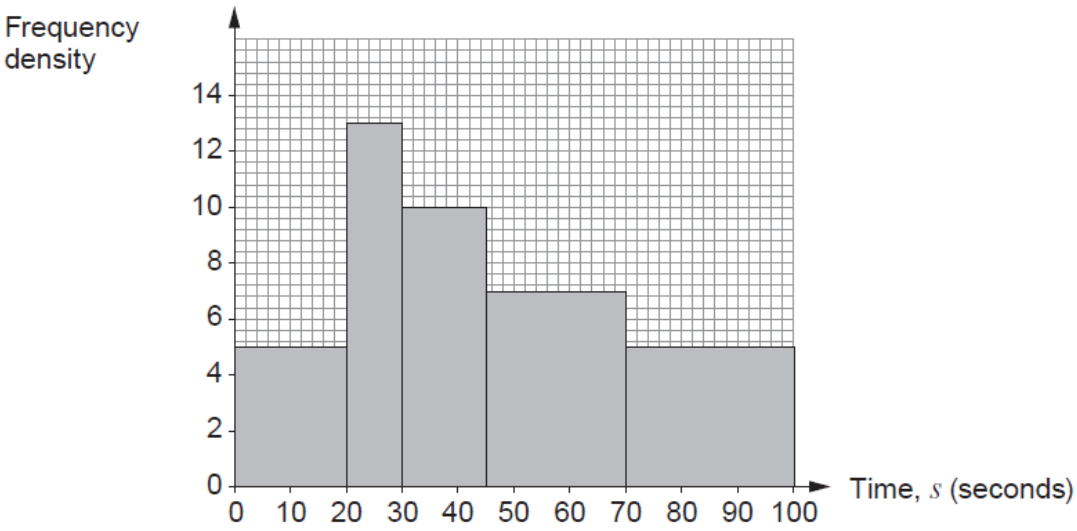
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#1

(a) Freya records how long each of 40 people can hold their breath.
The results are shown in the table.

Time, s (seconds)	Frequency
$0 < s \leqslant 20$	5
$20 < s \leqslant 30$	13
$30 < s \leqslant 45$	10
$45 < s \leqslant 70$	7
$70 < s \leqslant 100$	5

Freya wants to draw a histogram for this data.
This is the graph she draws.



Has Freya drawn a histogram?

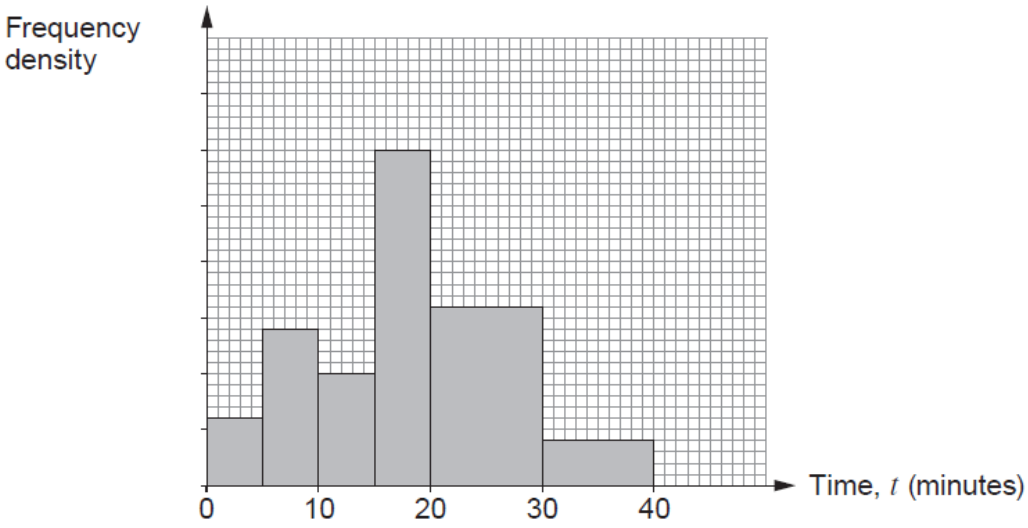
Yes ☐ No ☐

Give a reason for your answer. [1]

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(b) In one month, 2000 patients visited a doctors' surgery.
This histogram shows information about the length of time, t minutes, these 2000 patients spent at the surgery.



The group $0 < t \leqslant 5$ represents 120 patients.

How many patients are represented by the group $30 < t \leqslant 40$? [2]

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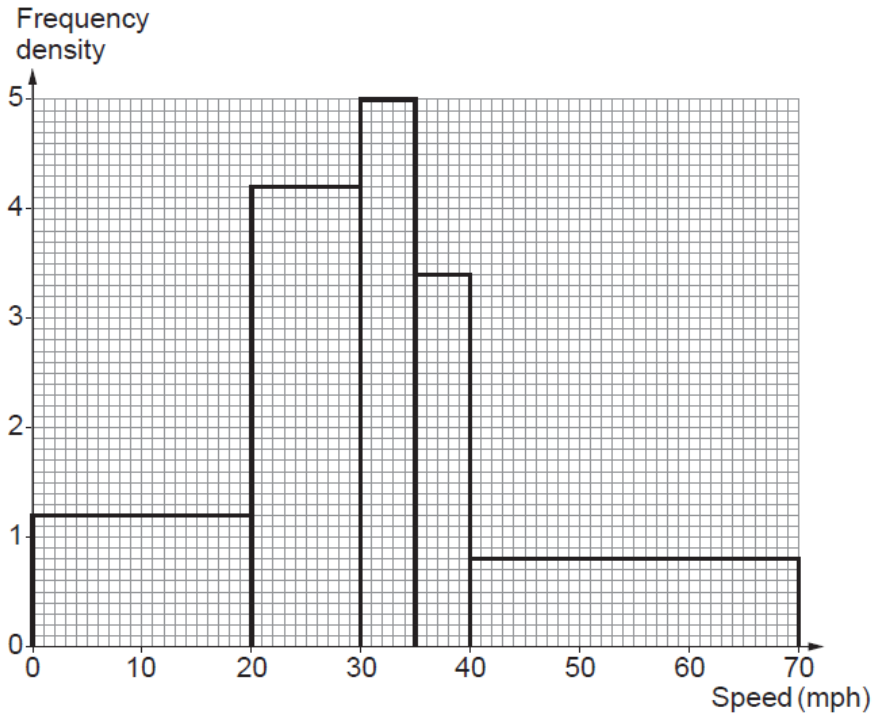
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Question taken from Eduqas examination paper 530004, November 2020

#2

A town council wishes to trial traffic-calming measures along a particular road in the town where the speed limit is 30 mph (miles per hour).

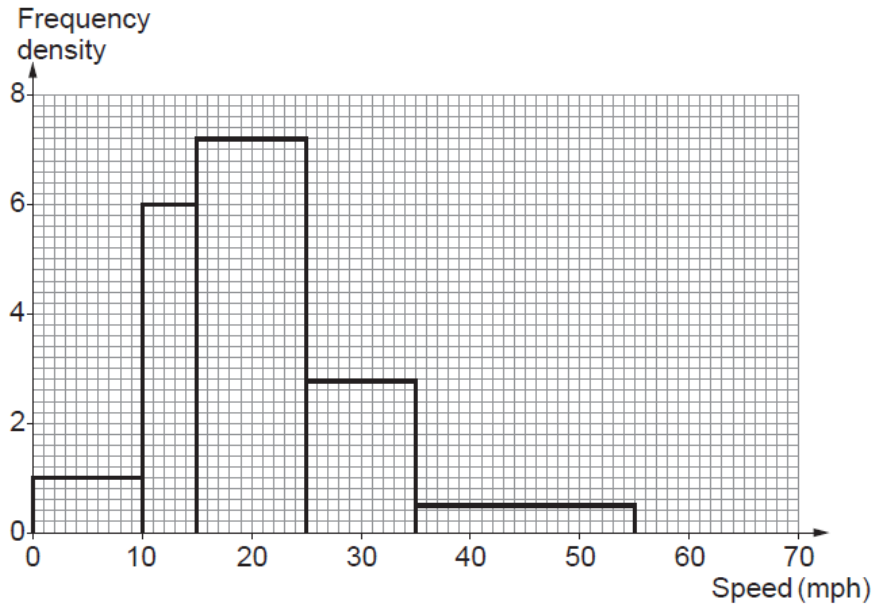
(a) For the first trial, additional **30 mph signs** were put in place.
Irene surveyed the average speed at which cars travelled along the road.
The results are shown in the histogram below.



Use the histogram to calculate an estimate for the median speed, in mph, of the cars Irene surveyed.
You must show all your working. [3]

Estimated median speed = ... mph

(b) In the second trial, **speed bumps** were put in place.
Irene surveyed the average speed of 150 cars.
The results are shown in the histogram below.



Irene says,

"84% of cars travel at 30 mph or less when speed bumps are in place."

(i) Show that Irene could be correct. [2]

.....

.....

.....

(ii) Explain why Irene could be incorrect. [1]

.....

.....

(c) Use information from the histograms to decide which traffic-calming measure is most effective.

30 mph signs ☐ Speed bumps ☐

Give a reason to justify your answer. [1]

.....

.....

.....

Question taken from Eduqas examination paper 530004, November 2024

#3

A number of girls and boys with part-time jobs answered an online survey.
One of the questions asked how long they each spent working last Friday.
Histograms of these results are shown on the opposite page.

(a) Calculate an estimate for the number of **girls** who worked for 45 minutes or less last Friday. [2]

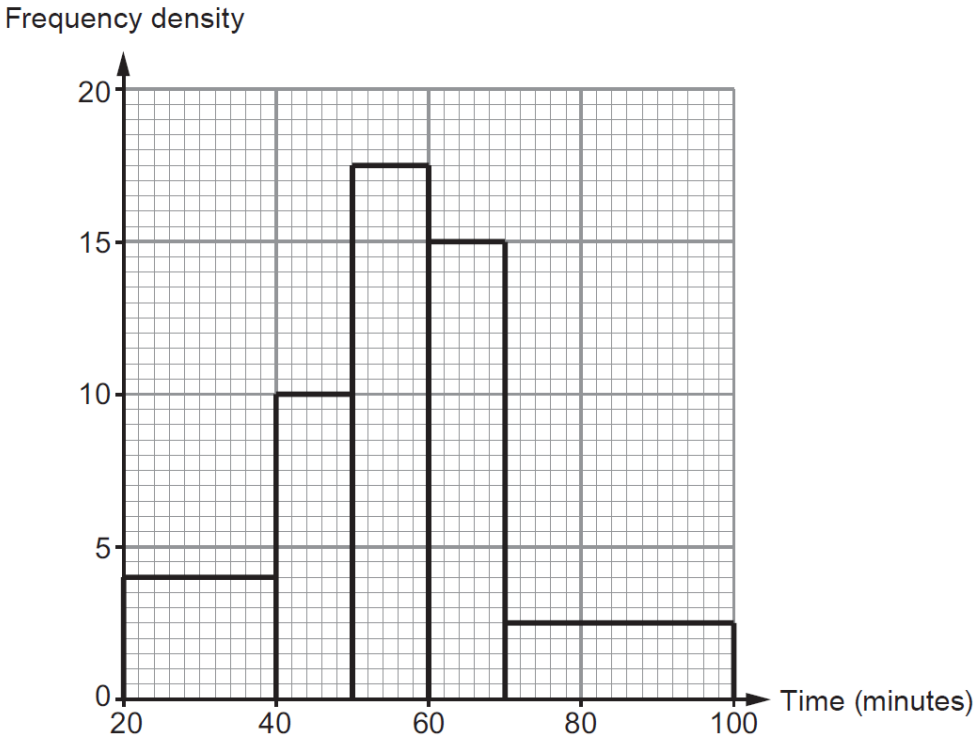
(b) Fred uses the results of the survey to compare the percentages of girls and boys who worked 1 hour or more last Friday.

580 girls took part in the survey.

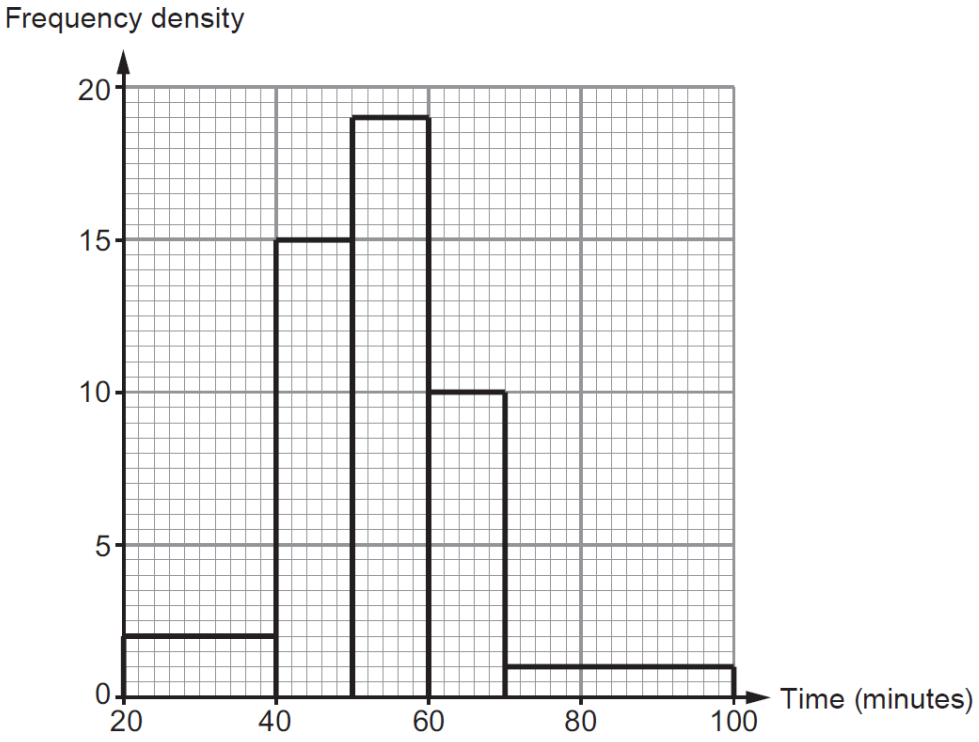
Complete the following statement.

..... % of girls compared with ..... % of boys worked for 1 hour or more last Friday. [6]

Girls



Boys



Question taken from Eduqas examination paper 530004, June 2018

Expected Outcomes: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	5	
Total	5	

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Marking Scheme

#1

GCSE (9-1) Mathematics Component 1: Higher Tier	Mark	
(a) 0.35 identified as the appropriate relative frequency for 400 customers	B1	and no other relative frequency
0.35 × 400 × 3 or 140 × 3 si	M2	FT 'their 0.35', provided it is 0.31, 0.43 or 0.38 or 0.34 or 0.36 for M2 or M1; no FT if e.g. a sum of relative frequencies has been used M1 for 0.35 × 400 si; not just for e.g. '0.35 of 400'
(£)420(.00)	A1	CAO
(b) Yes and valid explanation involving (1000 being) the **largest** number of customers e.g. 'It is the relative frequency from the largest sample.'	E1	Do not allow 'Out of 1000 customers 0.38 were sent a free box.' or 'Yes as the average relative frequency to customer ratio is higher'
	(5)	

Expected Outcomes: Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	3	
#3	4	
#4	5	
Total	15	

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Marking Scheme

#1

Component 2: Higher Tier	Mark	Comment
$\frac{2}{11} \times \frac{1}{10} \times 275$	M2	M1 for $\frac{2}{11} \times \frac{1}{10}$ (= $\frac{2}{110}$ or $\frac{1}{55}$ or 0.01818…)
= 5 (times)	A1	If no marks, award SC1 for an answer of 9 or 9.09… from $\frac{2}{11} \times \frac{2}{11} \times 275$
	(3)	

#2

GCSE (9-1) Mathematics Component 2: Higher Tier	Mark	Comment
(1 – 0.8(0)) × 40 OR 40 – 0.8(0) × 40 OR (0.15 + 0.05) × 40 OR 0.15 × 40 + 0.05 × 40	M2	M1 for sight of one of the following: • 1 – 0.8(0) • 0.15 + 0.05 • 0.2(0) • 0.8(0) × 40 • 32 • 0.15 × 40 • 0.05 × 40
8	A1	CAO
	(3)	

#3

Eduqas Autumn 2018 Component 2 Higher Tier	Marks	Comments
Probability of black is 0.1	B1	
Profit 300–300×0.1×2.50–300×0.2×1.50 (=300 – 75 – 90) or 300 (0.7× 1 – 0.1 × 1.5 – 0.2 × 0.5) (= 300 (0.7 – 0.15 – 0.1)	M2	May be seen in stages, must show full calculation method eventually FT 'their 0.1' provided it is clearly the probability of selecting a black ball M1 for sight of 300×0.1×2.50 or 300×0.2×1.50 (=165), or if one incorrect product within 300 (0.7× 1 – 0.1 × 1.5 – 0.2 × 0.5)
(£)135	A1 (4)	Only continue with FT 'their 0.1' provided 'their 135' > 125

#4

Eduqas Summer 2018 C2 Higher Tier Update 130618	Mark	Comment
(a) Indicates or implies 'No' or 'Don't know' with a reason, e.g. 'No, not all scores are equally likely', 'Don't know, as not enough throws to tell', 'No as it shows fewer 2s and 5s', "No, high numbers of 1 and 6', 'No, appears to be biased towards 1 and 6'	E1	Accept, e.g. 'No, should have equal amounts for each number', Allow, e.g. 'Don't know, dice are random so there could be variety in results', 'No, if fair all would be 1/6'
(b) $\frac{11}{120}$	B2	B1 for 11/… or $\frac{4 + 5 + 2}{40 + 40 + 40}$
(c) $\frac{37}{120}$ (× 480) 148	M1 A1 (5)	Accept $\frac{\text{'their } 4+5+4+8+8+8\text{'}}{\text{'their } 40 + 40 + 40\text{'}}$ (× 480) CAO A final answer of 148/480 is M1, A0

Two-Way Tables: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	5	
#2	6	
#3	6	
Total	17	

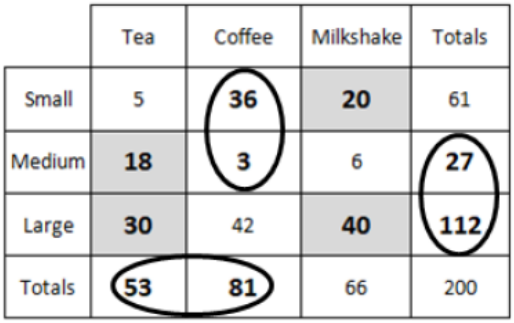
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Marking Scheme

#1

GCSE (9-1) Mathematics Component 1: Higher Tier	Mark	
<table><tr><th></th><th>Sprint</th><th>Middle</th><th>Long</th><th>Total</th></tr><tr><td>S</td><td>14</td><td>28</td><td>40</td><td>82</td></tr><tr><td>J</td><td>17</td><td>21</td><td>5</td><td>43</td></tr><tr><td>Tot</td><td></td><td></td><td>45</td><td>125</td></tr></table> OR <table><tr><th></th><th>Sprint</th><th>Middle</th><th>Long</th><th>Total</th></tr><tr><td>S</td><td>14</td><td>28</td><td>40</td><td>82</td></tr><tr><td>J</td><td>17</td><td>21</td><td>5</td><td></td></tr><tr><td>Tot</td><td>31</td><td>49</td><td>45</td><td>125</td></tr></table> $\frac{21}{125}$	B4 B1	Mark to the candidate's advantage Award B4 if 21 is in the cell for Junior middle distance runners and there are no incorrect entries in the table OR B2 for the given information correctly placed (shaded cells) or B1 for any 3 of these correct and B2 for the necessary unshaded cells correct or B1 for any 2 of these correct; ignore entries in the empty cells Allow 125 omitted but do not ignore an error if the value written in this cell is wrong FT $\frac{\text{'their derived 21'}}{125}$; denominator must be 125; and in a fraction <1; ignore attempts to convert to other forms e.g. decimal or ratio;
	(5)	

#2

Component 1: Higher Tier	Mark	Comment
 	B4	If the values are not in in the table they must be clearly identified. B4 for the whole table completed correctly. If not B4, award B3 for the 4 values in the shaded cells correct along with at least one circled correct pair (forming a correct total of 200): • 18, 30, 20, 40, 36 and 3 • 18, 30, 20, 40, 53 and 81 • 18, 30, 20, 40, 112 and 27 If not B3, award B2 for any one of the following correct values: • 18, 30, 20 and 40 • 18, 30, 53 and 81 • 30, 20, 40, 112 and 27 If not B2, award B1 for one of the following correct values: • 18 and 30 • 18, 20 and 40 • 30, 20 and 40
$\frac{18+3}{200}$ or $\frac{27-6}{200}$	M1	FT 'their 18' + 'their 3' provided non-zero or FT 'their 27' – 6, provided non-zero
$\frac{21}{200}$ oe ISW	A1	SC1 for 21/134 or 21/27
	(6)	

#3

GCSE (9-1) Mathematics Component 1: Higher Tier	Mark	Comment
<table><tr><td></td><td>S</td><td>M</td><td>J</td><td></td></tr><tr><td>A</td><td></td><td></td><td>24</td><td>110</td></tr><tr><td>B</td><td>25</td><td>29</td><td>6</td><td>60</td></tr><tr><td>C</td><td></td><td>40</td><td>0</td><td></td></tr><tr><td></td><td>75</td><td>135</td><td>30</td><td>240</td></tr></table> or <table><tr><td></td><td>S</td><td>M</td><td>J</td><td></td></tr><tr><td>A</td><td>20</td><td>66</td><td>24</td><td>110</td></tr><tr><td>B</td><td>25</td><td></td><td>6</td><td>60</td></tr><tr><td>C</td><td>30</td><td>40</td><td>0</td><td>70</td></tr><tr><td></td><td>75</td><td></td><td>30</td><td>240</td></tr></table>	B3	**Method 1: Using 135, 60, 29** B1 for the given 240, 110, 30, 25, 0, 40 (shaded) correctly placed; allow e.g. an X in the 0 cell B1 for the 75, 135 and 60 correctly placed; B1 for 24, 6, 29 correctly placed or **Method 2: Using 25, 40, 6, 66** B1 for the given 240, 110, 30, 25, 0, 40 (shaded) correctly placed; allow e.g. an X in the 0 cell B1 for the 75, 60, 70, 30 and 20 correctly placed; B1 for 24, 66, 6 correctly placed May be probabilities or frequencies; If values not in table then they must be clearly identified
$\frac{135+60-29\times2}{240}$ or $\frac{25+6+66+40}{240}$ oe	M2	FT 'their 135, 60, 29' or 'their 6, 66' for M1 or M2 providing they are non-zero M1 for sight of either $\frac{135+60}{240}\left(=\frac{13}{16}\right)$ oe , $\frac{25+6+66+40+2\times29}{240}\left(=\frac{13}{16}\right)$ oe or sight of 137
$\frac{137}{240}$ oe, CAO	A1	If B2 M2 allow SC1 for an answer of $\frac{163}{240}$ (uses 0.1×110) <table><tr><td></td><td>S</td><td>M</td><td>J</td><td></td></tr><tr><td>A</td><td>20</td><td>79</td><td>11</td><td>110</td></tr><tr><td>B</td><td>25</td><td>16</td><td>19</td><td>60</td></tr><tr><td>C</td><td>30</td><td>40</td><td>0</td><td>70</td></tr><tr><td></td><td>75</td><td>135</td><td>30</td><td>240</td></tr></table> OR $\frac{179}{240}$ (uses 0.1×30) <table><tr><td></td><td>S</td><td>M</td><td>J</td><td></td></tr><tr><td>A</td><td>20</td><td>87</td><td>3</td><td>110</td></tr><tr><td>B</td><td>25</td><td>8</td><td>27</td><td>60</td></tr><tr><td>C</td><td>30</td><td>40</td><td>0</td><td>70</td></tr><tr><td></td><td>75</td><td>135</td><td>30</td><td>240</td></tr></table> OR $\frac{167}{240}$ (uses 45 instead of 75) <table><tr><td></td><td>S</td><td>M</td><td>J</td><td></td></tr><tr><td>A</td><td></td><td></td><td>24</td><td>110</td></tr><tr><td>B</td><td>25</td><td>29</td><td>6</td><td>60</td></tr><tr><td>C</td><td></td><td>40</td><td>0</td><td></td></tr><tr><td></td><td>45</td><td>165</td><td>30</td><td>240</td></tr></table>
	(6)	

Two-Way Tables: Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
Total	2	

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Marking Scheme

#1

Component 2: Higher Tier	Mark	Comments
(b)(i) $\frac{87}{200}$ or 0.435 or 43.5%	B1	
(b)(ii) $\frac{43}{200}$ or 0.215 or 21.5%	B1	Note: Allow SC1 for both answers correct but in incorrect form. i.e. '87 out of 200' AND '43 out of 200'

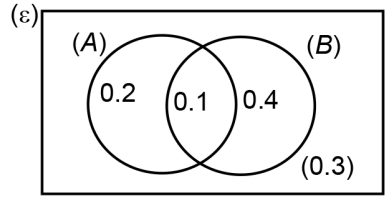
Venn Diagrams: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	5	
#2	6	
#3	6	
Total	17	

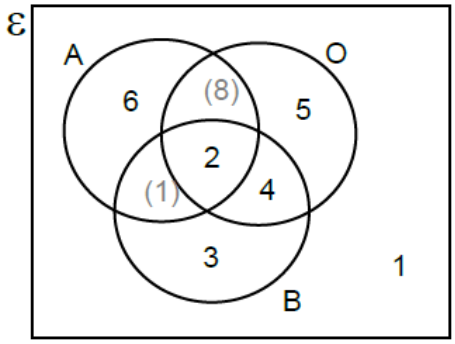
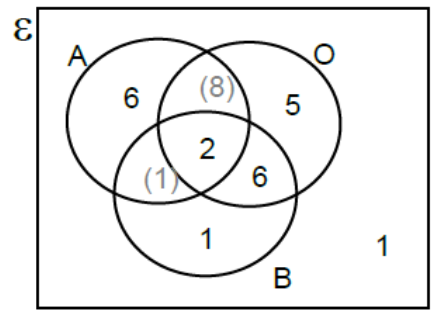
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Marking Scheme

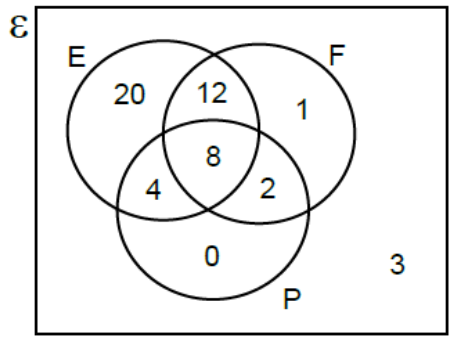
#1

Component 1: Higher Tier	Mark	
(a) Correctly completed Venn diagram e.g.  OR 0·7 – 0·3 + 0·1 oe 0·5	B2 B1	B1 for either: • 0·2 or 0·4 correctly placed in a Venn diagram or correctly identified, • 0·7 = 0·3 + *P(B)* – 0·1 FT 'their 0·4' + 0·1.
(b) $1 - P(A \cap B)$ oe or correct region on Venn diagram indicated. 0.9	S1 B1	Implied by e.g. 1 – 0·1 or 0·4 + 0·2 + 0·3 implies S1
	(5)	

#2

GCSE (9-1) Mathematics Component 1: Higher Tier	Mark	Comment
(a)  	B3	B2 for any 4 or 5 correct or B1 for any 2 or 3 correct FT where possible for B2 or B1 NB common solution for B2 will be 
(b) $\frac{1}{30}$ or equivalent	B1	ISW FT 'their 1', which may be zero or empty
(c) $\frac{7}{17}$	B2	FT 'their 6' + 1 (not their 17 as this is given) B1 for denominator of 17 or numerator of 7 or 'their 6' + 1, provided the fraction is < 1 or B1 for correct answer with wrong notation e.g. 7 out of 17 or 7 : 17
	(6)	

#3

Component 1: Higher Tier	Mark	Comment
(a)  	B3	The 0 entry can be empty or ∅ B2 for any 6 or 7 correct or B1 for any 4 or 5 correct
(b) $\frac{27}{50}$ ISW or 0.54	B1	For the numerator: FT 20 + 'their 4' + 0 + 3 provided 'their 4' > 0 OR 50 – (12 + 8 + 'their 2' + 1) provided 'their 2' > 0
(c) $\frac{16}{44}$ ISW	B2	For B2 or B1: FT numerator of 'their 12' + 'their 4' and denominator of 'their 20 + their 12 + their 8 + their 4' or 50 – ('their 0' + 'their 1' + 'their 2' + 'their 3') provided no values are negative and fraction < 1 B1 for denominator of 44 or numerator of 16 provided in a fraction < 1 OR B1 for a correct answer with wrong notation e.g. 16 out of 44 or 16 : 44
	(6)	

Venn Diagrams: Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	4	
#3	5	
#4	5	
#5	5	
#6	6	
Total	28	

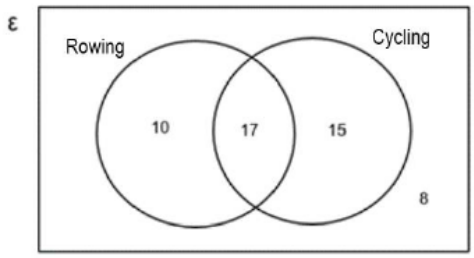
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Marking Scheme

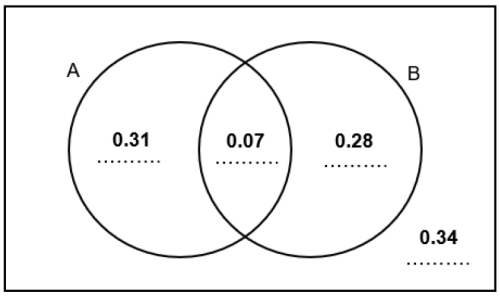
#1

Component 2: Higher Tier	Mark	Comment
(a) $\frac{33}{70}$ oe ISW	B1	Allow B1 for 0.47(142..) or 47(.142..)%
(b) $\frac{31}{64}$	B2	Allow B2 for 0.484(375) or 48.4(375)% B1 for sight of $\frac{a}{64}$ with $a < 64$ or $\frac{31}{b}$ with $31 < b \leq 70$. ISW for incorrectly simplifying their fraction
	(3)	

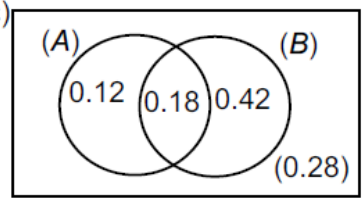
#2

GCSE (9-1) Mathematics Component 2: Higher Tier	Mark	Comment
(a) A fully correct Venn diagram  	B2	If zero is seen in the intersection award no marks. All blank spaces are assumed to be zero B1 for one of the following: • 8 and 17 correctly placed • 8 correct, Rowing 27 AND Cycling 32 e.g. 11, 16, 16 • 8 correct, Rowing 27 OR Cycling 32 AND the three values that add to 42 e.g. 11, 16, 15 • 10, 17, 15 correct and 8 omitted
(b) $\frac{10}{50}$ or $\frac{1}{5}$ oe ISW	B2	FT their Venn diagram provided no sections are left blank or zero. Mark to the candidates advantage. FT $\frac{\text{'their 10'}}{50}$ provided 'their 10' < 27 B1 for $\frac{\text{'their 10'}}{\text{'their 50'}}$ provided 'their 10' < 27 B1 for $\frac{\text{'their 10'}}{n}$ provided 'their 10' < 27 and 'their 10' < n < 50 Penalise incorrect notation (e.g. '10 in 50') −1.
	(4)	

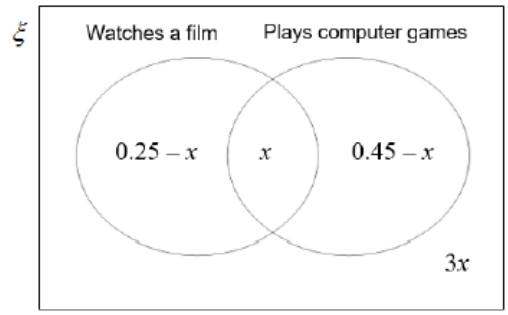
#3

Component 2: Higher Tier	Mark	Comment
(a) (0.66 – 0.07 – 0.31 =) 0.28	B3	B3 only if no incorrect working seen and/or Venn diagram correct. Otherwise, possible B1 or B2. B2 for a fully correct Venn diagram  or answer from 0.66 – 0.07 – 0.31 not for sight of B1 for at least two sections of the Venn diagram completed correctly or sight of 0.66 – 0.07 – 0.31
(b) 0.72	B2	B1 for 1 – 0.28 or 0.34 + 0.31 + 0.07 FT their Venn diagram or answer in (a) for B1 or B2 provided < 1
	(5)	

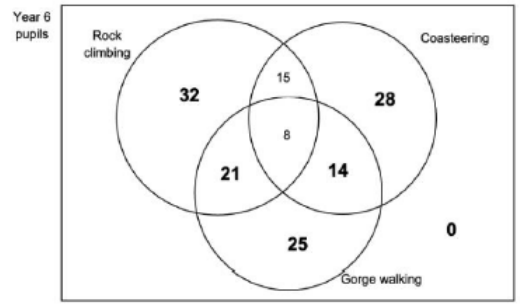
#4

GCSE (9-1) Mathematics Component 2: Higher Tier	Mark	Comment
(a) Correctly completed Venn diagram e.g. (ε)  or 0.12 + 0.42 or 0.3 + 0.6 – 2(0.18) or equivalent	B2	B1 for sight of a correct method to find the intersection e.g. 0.3 + 0.6 – 0.72 or $0.3 - x + x + 0.6 - x = 0.72$ or sight of 0.18
0.54	B1	FT 'their 0.12 + 0.42' or 0.3 + 0.6 – 2('their 0.18'); correct answer implies B2 B1
(b) $1 - P(A \cup B)$ or equivalent or correct region on Venn diagram indicated	S1	
0.28	B1	implies S1 FT 'their Venn diagram'
	(5)	

#5

GCSE (9-1) Mathematics Component 2: Higher Tier	Mark	Comment
(b)(i) Venn diagram correctly completed  	B1	
(b)(ii) $x + (0.25 - x) + (0.45 - x) + 3x = 1$ 0.15	M1 A1	FT 'their Venn diagram' provided of similar difficulty CAO
(b)(iii) $0.15 \div 0.25$ OR $(F \times 0.15) \div (0.25 \times F)$ OR $x \div 0.25$ 0.6	M1 A1	FT 'their 0.15'

#6

Component 2: Higher Tier	Mark	Comment
(a) A fully correct Venn diagram  	B3	Allow no entry outside the circles to imply zero If 15 is changed to 23 then no marks are awarded. • 21 in correct position • 14 in correct position • Rock climbing total = 76 23 + 'their 21' + 'their 32' = 76 • Coasteering total = 65 23 + 'their 14' + 'their 28' = 65 • Overall total = 143 Award B2 for four of the above conditions met. Award B1 for two or three of the above conditions met.
(b) $\frac{14}{143}$ oe ISW	B1	CAO
(c) $\frac{29}{68}$ oe ISW	B2	FT 'their 21' + 8 and 'their 21' + 'their 14' + 'their 25' + 8 for either B2 or B1 provided it gives a fraction < 1. B1 for one of the following: • $\frac{29}{a}$ provided a > 29 and a ≠ 143 • $\frac{\text{'their 21'} + 8}{b}$ provided b > 'their 21' + 8 • $\frac{c}{68}$ provided c < 68
	(6)	

Probability of Independent / Dependent Combined Events: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
#2	2	
#3	3	
#4	4	
#5	4	
#6	6	
#7	7	
Total	28	

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Marking Scheme

#1

GCSE (9-1) Mathematics Component 1: Higher Tier	Mark	Comment
$\frac{1}{8}$ oe; ISW	B2	B1 for $\frac{1}{2}\times\frac{1}{2}\times\frac{1}{2}$ oe If no marks awarded, then SC1 for evidence of the only possible score being 1, 1, 1 e.g. in a partially complete list of possible scores with all other scores even and 1 × 1 × 1 listed as odd
	(2)	

#2

Component 1: Higher Tier	Mark	
$\frac{2}{8}\times\frac{2}{8}$ or $\frac{1}{4}\times\frac{1}{4}$	M1	Or equivalent
$\frac{4}{64}$ or $\frac{1}{16}$ ISW	A1	Or equivalent
	(2)	

#3

Component 1: Higher Tier	Mark	Comment
$\left(\frac{6}{10}\times\frac{3}{9}\right)+\left(\frac{3}{10}\times\frac{6}{9}\right)$	M2	M1 for either product
$\frac{36}{90}$ oe ISW	A1	Must be from correct work, if shown
	(3)	

#4

Component 1: Higher Tier	Mark	
(a) $\frac{2}{5}\times\frac{1}{4}$ oe	M1	
$\frac{2}{20}$ oe, ISW	A1	not from wrong method
(b) $\left(1-\frac{2}{20}\right)\times\frac{2}{20}$ oe	M1	FT 'their derived $\frac{2}{20}$', providing it is not $\frac{2}{5}$ or $\frac{1}{5}$
$\frac{36}{400}$ oe, ISW	A1	CAO
	(4)	

#5

GCSE (9-1) Mathematics Component 1: Higher Tier	Mark	Comment
(a)* Valid comment e.g. 'The groups overlap so people who spent £20 may be in different groups.' or 'His groups are too big.' or 'You cannot tell which group 40 is in.'	E1	Do not allow comments such as 'The ages in the groups are too big'
(b)(i)* $\frac{1}{100}$ or equivalent	B2	B1 for $\frac{1}{10}\times\frac{1}{10}$ or equivalent
(b)(ii) (£) 688.97	B1	
	(4)	

#6

GCSE (9-1) Mathematics Component 1: Higher Tier	Mark	Comment
(a) (Probability 1st round draw =) $\left(\frac{4}{6}\times\frac{2}{5}\right)+\left(\frac{2}{6}\times\frac{4}{5}\right)$ or $1-\frac{2}{6}\times\frac{1}{5}-\frac{4}{6}\times\frac{3}{5}$ or equivalent, seen or implied	M2	Allow for a complete and correct sample space M1 for $\frac{4}{6}\times\frac{2}{5}\left(=\frac{8}{30}\right)$ or equivalent, seen or implied or M1 for sight of $1-\frac{2}{6}\times\frac{1}{5}$ or for sight of $1-\frac{4}{6}\times\frac{3}{5}$ or equivalent
$\frac{16}{30}\left(=\frac{8}{15}\right)$ or $\frac{4}{15}+\frac{4}{15}\left(=\frac{8}{15}\right)$ or $1-\frac{2}{30}-\frac{12}{30}$ or equivalent	A1	Evidence must be seen as $\frac{8}{15}$ is given e.g. $\frac{2}{6}\times\frac{1}{5}+\frac{4}{6}\times\frac{3}{5}=\frac{14}{30}=\frac{7}{15}$ so answer is $\frac{8}{15}$ implies M2 but is A0.
(b) Combines the probabilities correctly. $\frac{8}{15}\times\frac{2}{6}\times\frac{1}{5}$	M2	M1 for sight of (Probability Steve wins =) $\frac{2}{6}\times\frac{1}{5}$ oe or $\frac{2}{30}$ oe
$\frac{16}{450}$ or equivalent ISW	A1	Equivalent e.g. $\frac{8}{225}$
	(6)	

#7

GCSE (9-1) Mathematics Component 1: Higher Tier	Mark	Comment
(a)(i) Anya is incorrect with idea that they could be in any order i.e. SF' + S'F e.g. 'Anya has calculated the probability of passing Spanish only' 'Anya hasn't calculated the probability of passing French only'	E1	Do not allow the E1 for numerical 'explanations' only i.e. 'It should be 0.6 × 0.3 + 0.4 × 0.7' Do not accept 'she hasn't added the results together' unless explanation given for what is meant by 'results'
a(ii) (0.6 x 0.3) + (0.4 x 0.7) 0.46 oe	M1 A1	Award marks if seen in a(i) and not replaced. CAO
(b) 0·6x75 + 0·2x(75-0·6x75) (=45 + 6) $\frac{51}{75}$ oe ISW	M3 A1	Allow for appropriate sight of 45 AND/OR 6 throughout M2 for 0·6x75 AND 0·2x(75-0·6x75) (=45) (=6) M1 for one of the following: • 0·6 × 75 • 45 • 0·2 × (75 - 0·6 × 75) • 0·2 × 30 • 6 CAO
Alternative method *0·6 + (1 - 0·6) × 0.2. oe* 0·68	*M3* *A1*	*M2 for (1 – 0·6) × 0·2 oe. (= 0·08)* *M1 for 0.6 + 0.2 × ….. or 0.6 + (1 – 0.6) × …. oe*
	(7)	

Probability of Independent / Dependent Combined Events: Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	4	
#3	4	
#4	6	
Total	17	

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Marking Scheme

#1

GCSE (9-1) Mathematics Component 2: Higher Tier	Mark	Comment
(a) $0.3 \times 0.25 + (1 - 0.3)$ 0.775	M2 A1	M1 for sight of 0.3×0.25

#2

Component 2: Higher Tier	Mark	Comment
(a) $\frac{8}{17} \times \frac{7}{16}$	M1	
$= \frac{56}{272}$ or $\frac{7}{34}$ oe	A1	Allow 0.205 to 0.206 from correct working
(b) $\frac{8}{17} \times \frac{7}{16} + \frac{9}{17} \times \frac{8}{16}$	M1	FT Their answer to (a) + $\frac{9}{17} \times \frac{8}{16}$
$= \frac{128}{272}$ or $\frac{8}{17}$ oe	A1	Allow 0.47 or 0.471 from correct working
	(4)	

#3

GCSE (9-1) Mathematics Component 2: Higher Tier	Mark	Comment
(a) $\frac{4}{5} \times \frac{3}{10}$ or 0.8×0.3 oe	M1	
$= \frac{12}{50}$ or $\frac{6}{25}$ or 0.24 oe ISW	A1	
(b) $\frac{4}{5} \times \frac{7}{10} \times \frac{1}{5}$ or $0.8 \times 0.7 \times 0.2$ oe	M1	
$= \frac{28}{250}$ or $\frac{14}{125}$ or 0.112 oe. ISW	A1	
	(4)	

#4

	Mark	Comment
(a) 0.78 x 1 or equivalent, AND an attempt to consider the other 22%	M1	Not for sight of 78% alone
0.22 x ¼ or equivalent	M1	
Showing the need to add (0.78 + 0.055)	M1	Method considers 78% + 22% of ¼
0.835 or 83.5%	A1	*Alternative:* *(Number of questions)* *0.78 × 50 + (50 – 0.78 × 50) × 0.25* *M1* *(= 39 + 2.75 =) 41.75* *A1* *(Probability) 41.75/50 (FT from M1)* *M1* *= 0.835* *A1*
(b)Probability from part (a)×50	M1	FT from part (a), apart from 78% giving an answer of 39, this is M0 A0
41.75 with interpretation 'No'	A1	FT from part (a), apart from 78%, with appropriate interpretation ≥ 43 as 'yes' or <43 as 'no' Award M1 A1 for an appropriate conclusion without working only if the alternative method is used in (a) *Alternative 1:* *(43/50 as) 86% compared with probability 83.5%* *M1* *Interpretation 'No'* *A1* *Alternative 2:* *(With 83.5% seen in (a)) 41 or 42 questions correct* *M1* *Interpretation 'No'* *A1*
	(6)	

Tree Diagrams: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	4	
#2	5	
#3	6	
#4	6	
#5	7	
#6	7	
Total	35	

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Marking Scheme

#1

GCSE (9-1) Mathematics Component 1: Higher Tier	Mark	Comment
(a) 0.3×0.4	M1	
0.12	A1	Ignore attempts to convert to a different form Allow 12%; not from wrong working
(b) 0.7×0.6	M1	
0.42	A1	Ignore attempts to convert to a different form Allow 42%; not from wrong working
	(4)	

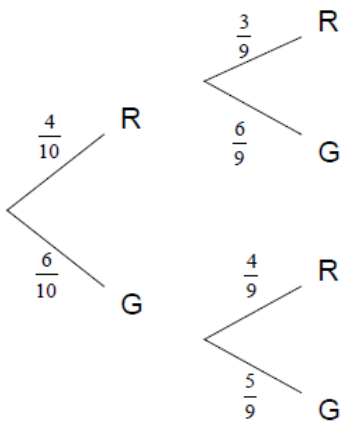
#2

Component 1: Higher Tier	Mark	
(a) 0.7 AND 0.9 correctly placed	B1	
(b) 0.6×0.3 oe	M1	
0.18 oe	A1	ignore attempts to convert to a different form; ignore embellishments such as unlikely, even if incorrect
(c) 0.4×0.1 oe	M1	
0.04 oe	A1	ignore attempts to convert to a different form; ignore embellishments such as unlikely, even if incorrect
	(5)	

#3

Component 1: Higher Tier	Mark	Comment
(a) 0.6 on the 'Does not go on a train' branch	B1	
Use of 0.4 × ..... = 0.28 OR 0·28 ÷ 0·4	M1	
P(Goes to the theatre) = 0.7	A1	Allow M1A1 if 0.7 seen on one of the 'Goes to the theatre' branches.
0.7, 0.3, 0.7 and 0.3 correctly placed	A1	FT 'their 0.7' only if M1 awarded. (0.28, 0.72, 0.28, 0.72 is M0A0A0)
(b) 0.6 × 0.3	M1	FT their tree provided both values between 0 and 1.
0.18	A1	
	(6)	

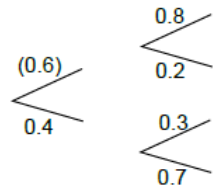
#4

GCSE (9-1) Mathematics Component 1: Higher Tier	Mark	Comment
(a) Correct tree diagram  	B3	B1 for left hand branches correct B1 for top right branches correct B1 for bottom right branches correct Allow equivalent fractions or exact decimals in all cases. If no marks then SC1 for two correct probabilities
(b) $\frac{4}{10}\times\frac{6}{9}+\frac{6}{10}\times\frac{5}{9}$ oe	M2	FT 'their probability tree' M1 for either product
$\frac{54}{90}$ oe; ISW	A1	CAO; Ignore any attempts to cancel or decimalise after a correct answer seen $\frac{54}{90}$ implies 3 marks but an answer of $\frac{6}{10}$ or $\frac{3}{5}$ without working earns 3 marks **only** if a correct tree seen in part (a).
	(6)	

#5

Component 1: Higher Tier	Mark	Comment
(a)		Allow equivalent decimal probabilities
$\frac{9}{10}$ and $\frac{1}{10}$ oe, correctly placed on the tree diagram	B1	
$\frac{9}{50} \div \frac{9}{10}$ or $\frac{9}{10} \times x = \frac{9}{50}$	M1	
$\frac{1}{5}$ oe	A1	Implies M1
$\frac{1}{5}, \frac{4}{5}$ and $\frac{1}{5}, \frac{4}{5}$ oe on tennis branches	B1	FT provided M1 awarded AND 'their $\frac{1}{5}$ and $\frac{4}{5}$' add to 1
(b)		FT 'their $\frac{1}{5}$ and $\frac{4}{5}$' provided they add to 1
$(\frac{9}{10} \times \frac{4}{5}) + (\frac{1}{10} \times \frac{1}{5})$ oe	M2	M1 for sight of $\frac{9}{10} \times \frac{4}{5}$ or $\frac{1}{10} \times \frac{1}{5}$ oe
$\frac{37}{50}$ oe	A1	
	(7)	

#6

	Mark	Comment
(a) Correctly completes the tree diagram  	B2	B1 for any two pairs of branches correct
(b) 0.6×0.8	M1	FT 'their 0.8' from their tree diagram provided it is greater than 0 and less than 1
0.48 oe	A1	FT
(c) $(0.6 \times 0.2) + (0.4 \times 0.7)$	M2	M1 for either (0.6×0.2) or (0.4×0.7) seen For M1 or M2, FT 'their probabilities from their tree' provided they are greater than 0 and less than 1
0.4 oe	A1	FT
	(7)	

Tree Diagrams: Calculator

Question	Maximum Mark	Mark Awarded
#1	4	
#2	6	
#3	7	
#4	8	
Total	25	

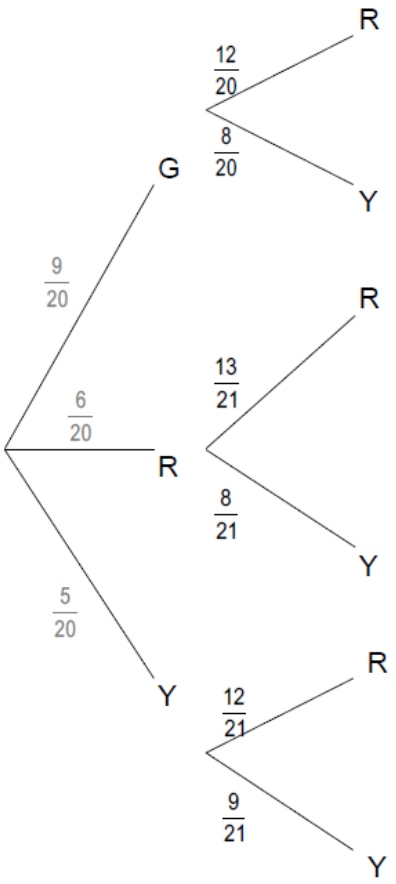
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Marking Scheme

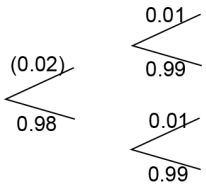
#1

GCSE (9-1) Mathematics Component 2: Higher Tier	Mark	Comment
(a) Correctly completing the tree diagram 0.6, 0.75, 0.25, 0.75 oe	B2	B1 for a correct pair of branches (total 1)
(b) 0.6 × 0.25 = 0.15 oe.	M1 A1	FT their tree diagram provided their values are between 0 and 1 FT Ignore incorrect conversion of 'their 0.15' to another form if the correct answer seen. Do not ignore further calculations.
	(4)	

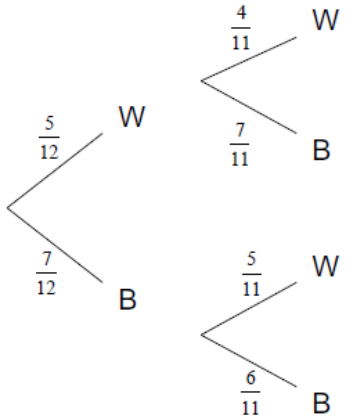
#2

Component 2: Higher Tier	Mark	Comment
(a) Correct tree diagram e.g.  	B3	B1 for each pair of branches correct Allow equivalent fractions in all cases.
(b) $\left(\frac{6}{20}\times\frac{13}{21}\right)+\left(\frac{5}{20}\times\frac{9}{21}\right)$ oe	M2	Check tree diagram FT 'their probabilities' for M2 or M1, providing at least B1 awarded in (a) M1 for sight of one correct product
$\frac{123}{420}$ or $\frac{41}{140}$ oe, ISW	A1	FT 'their tree diagram'
	(6)	

#3

Component 2: Higher Tier	Mark	Comments
(a) Correctly completes the tree diagram  	B1 B1	0.98 correctly placed 0.01 and 0.99 correctly placed on both pairs of branches
(b)(i) 0.98×0.99 0.9702 or $\frac{4851}{5000}$ oe	M1 A1	FT 'their 0.98 and 0.99' from their tree diagram provided they are less than 1 FT Allow 0.97 from correct working (not if unsupported)
(b)(ii) $(0.02 \times 0.99) + (0.98 \times 0.01)$ 0.0296 or $\frac{37}{1250}$ oe	M2 A1	For M1 or M2, FT their probabilities from their tree provided they are less than 1 M1 for either (0.02×0.99) or (0.98×0.01) FT Allow 0.03 from correct working (not if unsupported)
	(7)	

#4

GCSE (9-1) Mathematics Component 2: Higher Tier	Mark	Comment
(a) Correct tree diagram e.g.  	B3	B1 for left hand branches correct FT 'their $\frac{5}{12}$ or $\frac{7}{12}$' B1 FT for top right branches correct B1 FT for bottom right branches correct Allow equivalent fractions in all cases. If rounded decimals used here e.g. 0.42, 0.58, 0.36, 0.64, 0.45 and 0.55 award B1 here and FT in (b) and (c) for M marks only.
(b) $1-\frac{7}{12}\times\frac{6}{11}$ or $\frac{5}{12}\times\frac{4}{11}+\frac{5}{12}\times\frac{7}{11}+\frac{7}{12}\times\frac{5}{11}$ oe $\frac{90}{132}$ or $\frac{15}{22}$ oe	M1 A1	Check tree diagram FT 'their probabilities' providing at least B1 awarded in (a) FT 'their tree diagram' If no marks award SC1 for the correct sum of two of the required products e.g for: $\frac{5}{12}\times\frac{7}{11}+\frac{7}{12}\times\frac{5}{11}=\frac{70}{108}$ oe
(c) $\frac{5}{12}\times\frac{7}{11}\times\frac{6}{10}+\frac{7}{12}\times\frac{6}{11}\times\frac{5}{10}$ oe $\frac{420}{1320}$ or $\frac{7}{22}$ oe	M2 A1	Check tree diagram M1 for either product CAO
	(8)	

Constructing and / or Interpreting Tables / Charts / Diagrams: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
#2	2	
#3	2	
#4	4	
Total	10	

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Marking Scheme

#1

GCSE (9-1) Mathematics Component 1: Higher Tier	**Mark**	**Comment**
(a) Valid error comment e.g. 'The vertical scale from 1 to 174 is missing.'	E1	Accept an indication on the graph e.g. the scale break circled or a comment such as 'it is not accurately drawn especially next to the 0'. Do not allow e.g. 'The points have been connected' or 'Part of the scale is missing' (without further comment e.g. part of the vertical scale would be ok) Ignore embellishments to a correct statement provided they are not contradictory Accept an indication on the graph e.g. the scale break circled
(b) Valid impact comment e.g. 'It looks like there is a peak time at 10 am (when there is not).' or 'It makes the difference (at 10am) look greater.'	E1	They may have included some information in (a) to support their answer here, take the two parts together for this part if necessary and not contradictory but must have attempted an answer for (b) Allow e.g. 'They might not look at the y axis to see how small the difference really is.' Do not allow e.g. 'People will think there are less cars, like 2 instead of 176'.
	(2)	

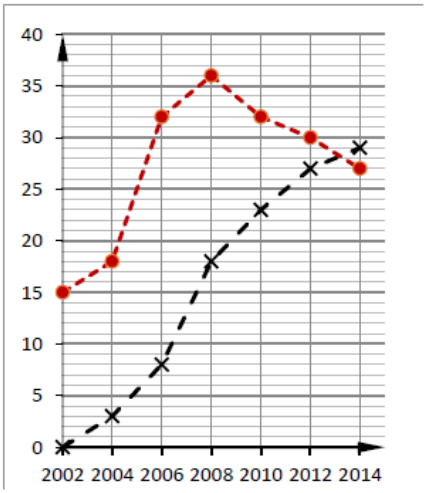
#2

GCSE (9-1) Mathematics Component 1: Higher Tier	Mark	Comment
In any order: Reason 1 - reference to only plotted six months of year e.g. • 'the graph shows sales are increasing but trend is different for first six months of year' • 'the highest values (January and February of 90 and 83) are not shown' Reason 2 - reference to scale not starting at 0 on y-axis e.g. • 'it looks like the sales have doubled (between July and December)'	E1 E1	Award maximum of E1 if both reasons come from same list Do not allow the following for either response: • any reasons relating to clarity of points / missing gridlines / circles rather than crosses • mention of winter clothing firm • 'full title missing' • 'scale is in 1000s may confuse' • the scale doesn't go up to 90 which is the highest value' – it didn't need to go up to 90 for Jul to Dec
	(2)	

#3

	Mark	Comment
(a) Valid comment e.g. 'Some of the data is lost' or 'There are too many categories for a pie chart' or 'It does not show coffee and green tea'	E1	Allow e.g. 'It does not show the value of sales'
(b) Valid comment e.g. 'The number of visitors seems to be decreasing' or 'The annual number is going down.'	E1	Ignore embellishments/superfluous comments about seasons. Allow e.g. 'From 2015 to 2018 the numbers have decreased.'
	(2)	

#4

GCSE (9-1) Mathematics Component 1: Higher Tier	Mark	Comment
(a) Correct plot	P1	May or may not be joined 
(b)(i) 2004	B1	
(b)(ii) 2006 and 2008	B1	
(b)(iii) Any valid comparison. e.g. 'The composting percentage is always increasing but the recycling percentage increases (until 2008) but then decreases.' or 'From 2012 the recycling and composting rates are about the same.' or 'From 2002 to 2008 both rates are increasing but after 2008 the recycling rate decreases whereas the composting rate keeps on increasing.' or 'The recycling rate is more than the composting rate until 2012 but in 2014 a greater % of waste is composted than recycled.' or 'More waste is recycled than is composted until 2012. (After that there is about the same amount of each).'	E1	A comparison does not need to mention the years but must mention composting **and** recycling. Allow e.g. 'Waste recycled has eventually begun to fall where compost has continued to gradually rise, (eventually taking over recycled waste)' or 'As the percentage of composting has increased the percentage of recycling has declined from 2008' or 'More waste is being recycled and composted in 2014 than in 2002' or 'Both the waste recycling and composting have increased between 2002 and 2014'
	(4)	

Constructing and / or Interpreting Tables / Charts / Diagrams: Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	5	
Total	8	

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Marking Scheme

#1

GCSE (9-1) Mathematics Component 2: Higher Tier	Mark	Comment
(a) Any valid reason e.g. '10 years is too far ahead to predict' 'the paper might not be produced if sales continue to fall' 'the change each time is not consistent'	B1	If a satisfactory reason is given ignore further spurious comments. Allow e.g. 'because the sales may not follow the pattern of the graph' 'there is not an equal; drop in numbers sold every 5 years' 'it's too far in the future we cannot tell' 'it could increase instead of decrease' 'more people may read the paper on the internet' Do not allow statements that do not relate to the graph e.g. 'there might be more or less than 10 000 sold in 2025' as no reference to the trend 'we can't tell' as no reference to time or trend
(b) (52 000 000 ÷ (16 + 9) ×16 33 280 000	M1 A1	Allow a place value slip in 52 000 000 for M1 only Allow 33 000 000 and 33 300 000
	(3)	

#2

Component 2: Higher Tier	Mark	Comments
(a)(i) 2014 and 2016	B1	
(a)(ii) No and valid explanation e.g. one of the following: 'There is no data for 2009' 'The data is only for even-numbered years.' 'The lines joining the points on a time-series graph have no value.' 'The graph shows 'households' and Jane mentions 'people'''	E1	Allow one of the following: 'There is no point on 2009' 'We can't tell the % exactly between the even years' 'It could be higher or lower between the plotted points'
(b)(i) All points correctly plotted	P1	Check overlay for tolerance Allow if plots are correct but incorrectly joined.
(b)(ii) 2018	B1	FT 'their plotted points' providing at least 5 points correctly plotted and a unique solution
(b)(iii) Comment that includes words indicating internet keeps on increasing whereas desktop ownership decreases (after 2014)	E1	A comment does not need to mention the years but must imply computer ownership **and** internet connection. Allow 'the county will follow a similar trend to Eduvale'
	(5)	

Averages and Range: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	5	
Total	5	

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Marking Scheme

#1

Component 1: Higher Tier	Mark	
(a) 20 × 170 + 30 × 180 (= 8800)	M2	M1 for either: • 20 × 170 (= 3400) • 30 × 180 (= 5400)
÷ 50	m1	dep on M2
176 (cm)	A1	Award M3 for 20/50 x 170 + 30/50 x 180 oe.
(b) Valid explanation e.g. • 'Only three of the team have heights below the mean'. • 'Most of the team have heights above the mean'. • 'The mean is affected by extreme values such as 150'. • 'The 150 is much smaller than the other heights'.	E1	
	(5)	

Averages and Range: Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
Total	2	

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Marking Scheme

#1

Eduqas Autumn 2018 Component 2 Higher Tier	Marks	Comments
Two unique possible reasons: • Didn't use raw data • Insufficient data	 E1 E1 (2)	E1 for any 1 possible reason Didn't use raw data includes, e.g. • 'median is (actually) 65(.15 cm)' • 'used rounded results' • 'depths were to the nearest 10 cm' Insufficient data includes, e.g. • 'needs to take more readings of depth' • 'only recorded at one time of the day' • 'may only have taken readings near the banks of the river' If the actual median is calculated it must be correct or approximately 65 (cm) *Depths recorded in order are 30, 50, 60, 80, 90, 100*

Properties of Populations from a Sample: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	3	
#3	3	
Total	9	

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Marking Scheme

#1

Component 1: Higher Tier	Mark	
(a) (Proportion of marked moths in sample is) $\frac{9}{12}\left(=\frac{3}{4}\right)$ oe, si or (Proportion of 2nd sample marked is) $\frac{9}{30}\left(=\frac{3}{10}\right)$ oe, si	B1	Allow for e.g. '9 out of 12 (marked)' or '9 (marked) out of 30' allow for sight of e.g. $\frac{12\times30}{9}(=40)$
Correct completion e.g. $\frac{9}{30}=\frac{12}{40}$ (so 40 moths) OR $\frac{9}{12}=\frac{30}{40}$ (so 40 moths) OR 75% (of population) is 30 (moths) so 100% (of population) is 30 + 10 = 40 (moths) oe	B1	Implies the first B1; Allow for • showing '12 out of 40' and '9 out of 30' are both '3 out of 10' or • $\frac{9}{12}=\frac{30}{x}$ and $9x = 360$, $x = 40$ oe NB $\frac{12\times30}{9}=\frac{360}{9}=40$ is B2
(b) Valid comment based on sample or population size e.g. 'It may not be very reliable as he only captured 12 moths in his first sample.' or 'Some of the moths may have been eaten so the results may not be accurate.'	E1	Allow e.g. 'Not reliable because the population would be bigger at different times of the year.' Allow comments which refer to the experiment needing to be repeated E1 for e.g. 'Somewhat reliable because it was done once and it could be different if repeated again' or 'Not reliable as he needs to do it more often.' Must not contain contradictions/errors but may contain irrelevant statements E0 for e.g. 'Not very reliable as there could have been more moths.' or 'Unlikely (to be reliable) because it has only been tested twice' or 'Not reliable because he could keep catching the same moths over and over.'
	(3)	

#2

GCSE (9-1) Mathematics Component 1: Higher Tier	Mark	Comment
(Proportion of tagged fish in sample is) $\frac{10}{100}\left(=\frac{1}{10}\right)$ or equivalent or (Proportion of sample tagged is) $\frac{10}{50}$ or equivalent	M1	Allow for e.g. '10 tagged out of 50'
$\frac{10}{50}=\frac{100}{500}$ or $\frac{10}{100}=\frac{50}{500}$ or 20% (of population) is 100 (fish) or equivalent	M1	Implies the first M1; allow for e.g. '100 tagged out of 500'; allow $\frac{100}{x}=\frac{10}{50}$ or $\frac{50}{x}=\frac{10}{100}$ or equivalent to score M1 M1
500 (fish) and do not allow fishing ticked or indicated	A1	CAO
	(3)	

#3

GCSE (9-1) Mathematics Component 1: Higher Tier	Mark	Comment
(Proportion of tagged coots in sample is) $\frac{20}{48}\left(=\frac{5}{12}\right)$ oe or (Proportion of sample tagged is) $\frac{20}{30}\left(=\frac{2}{3}\right)$ oe	M1	
$\frac{5}{12}=\frac{30}{72}$ or $\frac{2}{3}=\frac{48}{72}$ or $\frac{1}{12}$ (of population) is 6 (coots) oe	M1	Implies the first M1; allow $\frac{30}{x}=\frac{20}{48}$ or $\frac{48}{x}=\frac{20}{30}$ or $\frac{30\times48}{20}$ oe to score M1 M1
72	A1	CAO
	(3)	

Properties of Populations from a Sample: Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
Total	3	

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Marking Scheme

#1

Component 2: Higher Tier	Mark	Comment
(x =) $\frac{7 \times 1800}{150}$	M2	Award M2 for 1800 × 0.466(66..) OR 1800 ÷ 21.4(28…) from premature approximation M1 for $\frac{x}{1800} = \frac{7}{150}$ OR $\frac{1800}{x} = \frac{150}{7}$ OR $\frac{x}{7} = \frac{1800}{150}$
(x =) 84	A1	A0 for $\frac{84}{1800}$ OR $\frac{84}{150}$
	(3)	

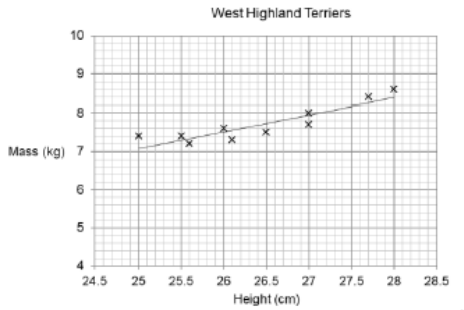
Scatter Diagrams: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	4	
#3	4	
Total	11	

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Marking Scheme

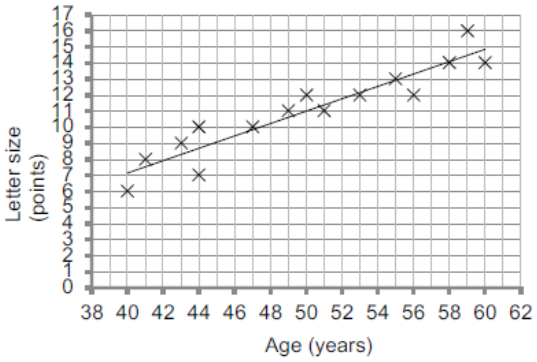
#1

GCSE (9-1) Mathematics Component 1: Higher Tier	Mark	Comment
(a) Correct line of best fit	B1	Following trend with some points above and below 
(b) Answer in the range 7.5 to 8 (kg)	B1	Or FT their line for an answer outside this range
(c) No with valid reason e.g. 'It is too tall' or 'A dog of mass 8.2 kg should have a height of about 27.5 cm'	E1	Allow e.g. 'For a dog of 35 cm, 8.2 kg is not heavy enough.' or 'Its height does not match its weight.' Allow e.g. 'It is too far off the line of best fit.' provided B1 has been awarded in (a).
	(3)	

#2

GCSE (9-1) Mathematics Component 1: Higher Tier	Mark	Comment
(a) Valid explanation e.g. 'Correlation does not imply causation.' or 'The manager has confused correlation with causation.' or 'Something else may have made the number of hat and hot drinks increase together, such as the weather getting colder.'	E1	Allow e.g. 'Both increased over 10 days but not because of each other' or 'The graph does not provide evidence that one has caused the other, there could be a common cause for the two.'
(b)(i) Correct line of best fit drawn	B1	Following trend with points above and below; must be ruled
(b)(ii) Answer in the range 28 to 33	B1	FT 'their line of best fit'
(b)(iii) Valid comment e.g. 'It will give a negative number of drinks.' or 'It may not be very accurate as there is not much data.' or 'Even though the correlation is negative, you cannot be sure of the pattern.' or 'Other things may influence the sale of the drinks besides the weather so it may not be very accurate.' or 'It is outside the data given.'	E1	Do not accept 'Not suitable at all' without justification. Accept comments that imply e.g. the relationship is not linear. Allow e.g 'It is only based on findings from 10 days' Do not allow e.g. 'Not suitable as not enough information'
	(4)	

#3

GCSE (9-1) Mathematics Component 1: Higher Tier	Mark	
(a) Correct, ruled, single line of best fit drawn, passing through the point (50, 11)	B2	Must have some points above and some points below the line and follow the trend of the data; if more than one line is drawn, mark the worst; must extend at least from age 42 to 58, may be longer but not shorter; For B2 or B1: **if a point is plotted** at (50, 11) mark **clear** intent to pass through (50, 11), **if no point plotted** must pass exactly through this point; B1 for a ruled, single line of best fit with some points above and some points below the line and following the trend of the data and extending at least from age 42 to 58 but not passing through (50, 11) or a ruled, single line of best fit with positive gradient passing through (50, 11) but not fitting criterion for points above and below and/or trend and/or length 
(b)(i) Between 11 and 13 inclusive	B1	If not in this range allow FT of 'their line of best fit' providing it is an attempt at a single line, ruled or unruled; allow answers in this range even if no line drawn; allow decimal answers; allow FT values to be rounded or truncated to the nearest integer
(b)(ii) No indicated and a valid reason e.g. 'There is no data for 30 years old' or 'Younger people often have better eyesight than older people.'	E1	Any reason that indicates Jared is outside the data set e.g. Accept: 'His age is not on the scatter graph.' Allow: 'The lowest age on the graph is 38' or '30 wasn't listed'. Do not accept 'Different ages, vision can vary between people.' (too vague) Allow extra irrelevant comments providing they are not contradictory.
	(4)	

Scatter Diagrams: Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
Total	2	

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Marking Scheme

#1

Component 2: Higher Tier	Mark	Comment
(a) Valid criticism e.g. 'There are no points above the line.' 'There should be some points above and below the line.' 'It does not follow the trend of the data.'	E1	Allow e.g. 'She has just joined the first point to the last.' 'It is not through the middle of the points.' 'It is not in between all the points.' Do not allow e.g. 'The line is in the wrong place.' 'It does not go through many points.'
(b) No indicated and valid comment e.g. 'Correlation does not imply causation.' or 'There could be another reason such as owning a dog for example would mean you took more exercise.'	E1	Allow e.g. 'There is no relationship between them, it is just a coincidence.' 'Owning a pet has nothing to do with going to the doctors.'
	(2)	

Designing / Criticising Questionnaires: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
#2	4	
#3	4	
Total	10	

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Marking Scheme

#1

GCSE (9-1) Mathematics Component 1: Higher Tier	Mark	
An appropriately worded question with an appropriate set of response options e.g. 'Which method do you use most often to learn about recent national political events? Social Media Newspaper Radio Other None'	B2	Question must include at least 'recent' or 'national' as well as 'politics' or 'political events' and at least 4 response options, covering a full range of answers, including e.g. 'other' or 'none' B1 for an appropriately worded question or for an appropriate set of response options
	(2)	

#2

GCSE (9-1) Mathematics Component 1: Higher Tier	**Mark**	**Comment**
(a) Two distinct reasons based on sample size, location, time or bias. e.g. 'She needs to ask more than 20 people.' or 'She needs to vary the time that she asks people' or 'People at the bus station may be biased against cars'	E2	E1 for each valid reason; reasons need to be distinct; comments made regards time could be 'hours spent' or 'time of day' or 'days of the week attended' and these can be considered as distinct Allow e.g. 'It's only the first 20 people.' (sample size) or 'People might have to get on the bus.' (location) or 'It will be all school children at that time of day.' (time or bias) Do not allow e.g. 'People might lie' or 'People might not want to talk.'
(b) Two distinct criticisms based on time frame **and** response boxes. e.g. 'She has not said per day, per week etc' or 'The times are too vague' or 'There is nowhere to answer if you do not have a car' or ' 4 is repeated'	E2	E1 for each valid criticism; criticisms need to be distinct (one comment only on response boxes and one on time frame omitted) Allow e.g. 'It is not specific enough.' (BOD time) or 'People might not have a car.' (Response boxes)
	(4)	

#3

GCSE (9-1) Mathematics Component 1: Higher Tier	Mark	Comment
(a) An appropriately worded question e.g. How much do you spend each month on gym membership? AND An appropriate set of response boxes e.g. c =£0, £0 < c ≤ £10, £10 < c ≤ £20, c > £20 less than £10, £10-£20, more than £20	B2	Question must include 'each month', There must be a **minimum of 3 response** boxes which: • do not overlap • cover all amounts including £0 and no upper limit with the exception of allowing a consistent £1 gap e.g. £0 £1 to £10, £11 to £20, £21 or more *Note: If inequalities are used then allow e.g.* *< 5, 5 - 10, 11 - 15, > 15* *OR 5 >, 5 - 10, 11 - 15, 15 <* *OR 0 ≤ 10, 11 ≤ 20, 21 ≤ 30, ≥ 31* *where the inequalities are in the correct directions and the groups are clear.* *Treat as one error incorrect use e.g.* *0 ≥10, 11 ≥ 20, 21 ≥ 30, 31 ≥* B1 for one of the following: • an appropriately worded question with no more than 'one identified error' from above response boxes. • a question that does not include 'per month' but with no errors in the response boxes.
(b)(i) Appropriate explanation e.g. 'The mean is affected by the few people who spent a long time (in the leisure centre).' 'The mean can be significantly affected by outliers or skew' 'It would be more accurate to use the mode' 'Most people spent less than 7 hours (in the leisure centre).' 'The modal time (or median time) is 0 – 4 hours.'	E1	Do not accept: 'The mean is not the best average.'
(b)(ii) Appropriate reason e.g. 'Not enough people asked.' 'Many responding 0-4 hours probably didn't go to the leisure centre'	E1	Do not accept: 'Some people spend longer than 24 hours' 'He only asked in one area' 'Only collected data for one week' 'They may spend different amounts of hours each week'
	(4)	

Designing / Criticising Questionnaires: Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
Total	2	

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Marking Scheme

#1

Component 2: Higher Tier	Mark	Comments
(a) An appropriately worded question e.g. How much money do you spend each month on Pop? AND An appropriate set of response boxes (£)0 (£)1 – (£)3 (£)4 – (£)6 More than (£)6	B2	Question must include 'each month' oe, Allow 'how many bottles' A minimum of 3 response boxes which must cover all options including 0 AND 'no upper limit' AND no overlap Award B1 for an appropriately worded question with no more than 'one identified error' from above response boxes Award SC1 for question that includes 'per week' or 'per day' and fully correct set of response boxes.

Estimating the Mean from Grouped Frequency Tables: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	6	
Total	6	

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Marking Scheme

#1

Component 1: Higher Tier	Mark	Comment
(a) Midpoints 5 15 25 35	B1	
5×10 + 15×12 + 25×16 + 35×12 (50 + 180 + 400 + 420) (= 1050)	M1	Only FT for 'their midpoints' provided at least 3 of them are at the bounds or within the groups If midpoints are **not** stated, award B1 M1 for 50 + 180 + 400 + 420 OR 1050 B1 M0 for 50,180,400 and 420 B0 M1 for the sum of 4 values with 3 correct
÷ 50	m1	
21	A1	FT correct evaluation using their midpoints. On FT, allow truncated answers or rounded to nearest whole number or better
(b)		FT 'their 50' from (a) for B1 and B2 Do not allow 'their 50' = 100
40 (%)	B2	B1 for sight of $\frac{12+\frac{16}{2}}{50}$ (×100) Allow B1 for 20 out of 'their 50' On FT the percentage must be given correct to the nearest integer or better for the award of B2
	(6)	

Estimating the Mean from Grouped Frequency Tables: Calculator

Question	Maximum Mark	Mark Awarded
#1	4	
#2	4	
#3	5	
#4	5	
#5	5	
#6	5	
#7	6	
#8	6	
#9	8	
Total	48	

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Marking Scheme

#1

Component 2: Higher Tier	Mark	Comment
(a) (650 × 8 + 750 × 7 + 850 × 4 + 950 × 11)	M1	(= 24300)
÷ 30	m1	
810 (grams)	A1	
(b) Valid comment e.g. 'Her answer will be an underestimate.' 'She is using the lowest values so the mean will be too small'.	E1	Allow answers that state that the calculated mean will be smaller or indicate that the lowest values do not represent the groups, e.g. 'Her method will give a smaller mean.' 'Because these values do not represent the entire range.' 'Because she ignored the distribution in each interval.' 'Because she is using the minimum masses making at an unfair estimate.' Do not allow e.g. 'She has used the smallest value in each group.' 'Because these values are the lowest bounds.' 'Because it is not as accurate as the midpoints.' 'It is better to use the midpoints'
	(4)	

#2

Component 2: Higher Tier	Mark	Comment
Mid-points: 45, 75, 105, 135, 165	B1	May be implied from correct totals, see below
45 × 9 + 75 × 33 + 105 × 38 + 135 × 8 + 165 × 2	M1	FT 'their mid-points' provided at least 4 of these are at the bounds or within the groups 405 + 2475 + 3990 + 1080 + 330 (= 8280) If mid-points are **not** given then no marks except for the following cases: • B1 M0 for five correct products not added • B1 M1 for five correct products in an addition • B0 M1 for four correct products in an addition
÷ 90	m1	
92 (grams)	A1	FTcorrect evaluation using their mid-points Allow truncated or rounded decimal answers
	(4)	

#3

Eduqas Summer 2018 C2 Higher Tier Update 130618	Mark	Comment
(a) Midpoints 10, 30, 50, 70, 90	B1	
1×10+8×30+9×50+7×70+6×90	M1	FT 'their midpoints' provided these are at the bounds or within the groups (10 + 240 + 450 + 490 + 540 = 1730)
÷ 31	m1	
55.8(…cm)	A1	Accept 56(cm) from correct working
(b) Argument presented to include that (some) other groups could have snowfall towards the lower end of the group, e.g. 'group 20 to 40 (cm) may have actual snowfall between 21 and 23 cm'	E1 (5)	Accept 'the mean changes by about 2(.3 cm), so still about the same' Allow, e.g. 'Would not impact on the mean much' Do not allow an argument presented saying 'do not know the actual snowfall for the other groups' Do not accept an argument based on the reason for using midpoints without further clarification

#4

GCSE (9-1) Mathematics Component 2: Higher Tier	Mark	Comment
Mid-points: 75, 85, 95, 105, 115	B1	May be implied from correct totals, see below.
75 × 5 + 85 × 7 + 95 ×12 + 105 ×11 + 115 ×10	M2	FT 'their mid-points' provided at least 4 of these are at the bounds or within the groups 375 + 595 + 1140 + 1155 + 1150 (= 4415) M1 for the addition of five products allowing one error with the frequencies. If mid-points are **not** given, then no marks except for the following cases: • B1 M0 for five correct products not added • B1 M2 for five correct products in an addition • B0 M1 for four correct products in an addition
÷ 45	m1	
$98\frac{1}{9}$ or $\frac{883}{9}$ or 98.1(1…) (seconds)	A1	FT provided M2 m1 awarded, for the correct evaluation using their mid-points Allow 98 from correct working. Allow truncated or rounded decimal FT answers.
	(5)	

#5

Component 2: Higher Tier	Mark	Comment
(a) Mid-points 62.5 67.5 72.5 77.5 82.5	B1	May be implied from correct totals, see below
62.5 × 19 + 67.5 × 17 + 72.5 × 23 + 77.5 × 10 + 82.5 × 1	M1	FT 'their mid-points' provided at least 4 of these are at the bounds or within the groups 1187.5 + 1147.5 + 1667.5 + 775 + 82.5 (= 4860) If mid-points are **not** given, then no marks except for the following cases: • B1 M0 for five correct products not added • B1 M1 for five correct products in an addition • B0 M1 for four correct products in an addition
÷ 70	m1	
= 69.4(2…) (cm)	A1	FT Accept 69 (cm) from correct working.
(b) No indicated or clearly implied and a suitable explanation e.g. 'The median is in the group $65 \leq l < 70$.' 'The median is the 35th (or 35.5th) term and in the group $65 \leq l < 70$.'	B1	Allow 'No' with an explanation e.g. '(In group) 65 – 70' Do not allow 'No' and explanation based on 69(.42) or 'their 69(.42)' e.g. 69 is not between 70 and 75 (use of mean) or '70 to 75 is the modal length'
	(5)	

#6

GCSE (9-1) Mathematics Component 2: Higher Tier	Mark	Comment
(a) Midpoints 30, 60, 90, 125	B1	
30 × 68 + 60 × 186 + 90 × 238 + 125 × 108 (2040 + 11160 + 21420 + 13500 = 48120)	M1	FT 'their midpoints' provided at least 3 of 'their 4 midpoints' lie within the appropriate group, including lower and upper bounds for the last 3 marks
÷ 600	m1	
80.2(minutes) oe	A1	Note: final answer 79.3 follows from using the midpoints 30, 60, 90, 120 to find $\frac{47580}{600}$.
(b) (Best estimate) 77.2(minutes) oe OR for a clear explanation that we cannot tell e.g. 'We do not know how many values will change group' or 'Slightly less as a few will move to the group below'.	B1	FT 'their 80.2' – 3 Do not award the mark if the explanation is contradicted by 'the mean will be higher'.
	(5)	

#7

	Mark	Comment
(a)(i) Mid points: 15, 25, 35, 45 $15\times5 + 25\times20 + 35\times23 + 45\times52$ $(= 75 + 500 + 805 + 2340 = 3720)$ $\div 100$ 37(.2mm)	B1 M1 m1 A1	 FT provided 'their midpoints' within the 'bounds' inclusive Unsupported 37.2, award all 4 marks
(a)(ii) $40 \leq x < 50$	B1	Accept any unambiguous indication
(b) Explanation such as: 'the mean doesn't tell you about the spread of the data', 'all the depths could be very close to 37.2 mm (whilst Marie's table shows her display is spread out)' (6)	E1	Do not accept indication of 'Yes' or an explanation implying 'Yes' Do not accept contradictions Allow if range of Marie's display is used, with lower and upper values considered at 10 mm and 50 mm, or within 1st and last groups Do not accept arguments based on shapes or styles of frames, reasoning and validity of argument must be based only on the depth of lens

#8

Eduqas Autumn 2018 Component 2 Higher Tier	Marks	Comments
(a) 135 (matches)	B1	
(b)(i)Midpoints 10, 30, 50, 70, 90 Sum of the products of interval points and frequencies, e.g. for midpoints use: $10\times40 + 30\times30 + 50\times35 + 70\times20 + 90\times10$ $\div 135$ (Use of midpoints gives) 39.6(29...minutes)	B1 M1 m1 A1	 FT 'their interval points' (=5350) FT 'their 135' from (a) Allow 40 (minutes) from correct working Accept an answer for correct working between 29.6 and 49.63 (minutes) inclusive (Use of upper bounds gives 6700 ÷ 135 = 49.6(29...)) (Use of lower bounds gives 4000 ÷ 135 = 29.6(29..))
(b)(ii) Statement relevant to their assumption, e.g. if upper bounds used 'the actual mean could be less', if lower bounds used 'the actual mean could be greater', if midpoints used 'the mean could be lower' or 'the mean could be higher' or 'the mean could be higher or lower' (6)	E1	Accept 'matches with no goals were not included so the actual mean time is greater'

#9

Eduqas Autumn 2019 C2 Higher Tier	Mark	Comment
(a)* 2.6 (cm)	B1	
(b)* Mid points 2, 3, 4, 5, 6 $2 \times 4 + 3 \times 2 + 4 \times 1 + 5 \times 0 + 6 \times 3$ $\div 10$ 3.6 (cm)	B1 M1 m1 A1	 FT 'their mid points' provided 4 lie within, including 'bounds', of the groups, allow 1 of the mid points is outside the group
(c)* $5 \times 4.7 + 23.9$ $\div 6$ 7.9 (cm)	M1 m1 A1 (8)	

Cumulative Frequency & Box Plots: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
#2	4	
#3	6	
#4	7	
#5	8	
#6	9	
#7	11	
#8	11	
Total	58	

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Marking Scheme

#1

Component 1: Higher Tier	Mark	
(a) Two valid, different criticisms e.g. • 'She has used the midpoint from each class (, not the upper, when plotting)' • 'She should have used the higher value from each group (for her plots, not the midpoint.)' AND • 'The first point should not be at (0, 0), (it should be at (3, 0).)' • 'The graph shows there is data between 0 and 3 (when there is none.)'	E2	One comment about the midpoint being used and the other comment about the plot at the origin. E1 for one valid criticism.

#2

GCSE (9-1) Mathematics Component 1: Higher Tier	**Mark**	**Comment**
(a) Left whisker 1.5 and right at 5 LQ 2.5 LQ 2.5, median 4 and UQ 4.5 in a box plot	B1 B1 B1	 Seen or implied Must be seen in a correct box plot, FT their LQ; if no LQ is stated and it is not at 2.5 allow this mark provided 1.5 < LQ < 4;
(b) No with valid explanation e.g. 'Box plots do not show the individual data points.' or 'box plots only show summary statistics'	E1	Allow e.g. 'a box plot only summarises the data' or 'it does not show every value recorded' Do not allow e.g. 'There is no data for days in the box plot' or 'There is no indication of the number of days Ellie took to accumulate the data.'
	(4)	

#3

	Mark	Comment
(a) 70 (cm)	B1	
(b) 58 (cm)	B1	
(c) Left whisker 26 and right at 72 UQ 62 LQ 42, median 46 and UQ 62 in a box plot	B1 B1 B1	 si Must be seen in a correct box plot, FT 'their stated 62'
(d) Black and White indicated with valid reason e.g. 'no more than half the red and white koi are greater than 48 whereas ¾ of the black and white are greater than 50'.	E1	Justification must be complete and if using e.g. lower quartiles they must interpret these as being 25% oe Allow e.g. 'less than half the red and white koi are greater than 48 whereas ¾ of the black and white are greater than 50'.
	(6)	

#4

GCSE (9-1) Mathematics Component 1: Higher Tier	**Mark**	**Comment**
(a)(i) 14	B1	
(a)(ii) M: 36 | LQ: 30 | UQ: 43 | IQR: 13	B3	B1 Correct median B1 Correct LQ & UQ B1 Correct FT IQR
(b)(i) Correct box plot: Whiskers from 22 to 49 Box from 30 to 43 Median at 36	B2	FT 'their values from (a)(ii)' if possible B1 for 2 out of 3 correct or correct FT from whiskers, box, median
(b)(ii) *Firebird Marigold* and correct reason e.g. '75(%) of these plants were more than 30 cm tall whereas less than 75(%) of the Marvel ones were.'	E1	Allow e.g. 'More of the Firebird are taller than 30 cm' or '75(%) of the Firebird are taller than 30 cm' or 'Because the lower quartile of the Firebird marigolds is higher being equal to 30.' Do not accept e.g. 'More of the Firebird are taller.' or 'It has the closest range to 30.' or 'It has a higher lower quartile.' Must not have any incorrect justification e.g. 'More of the Firebird are taller than 30 and the interquartile range is higher.' is E0
	(7)	

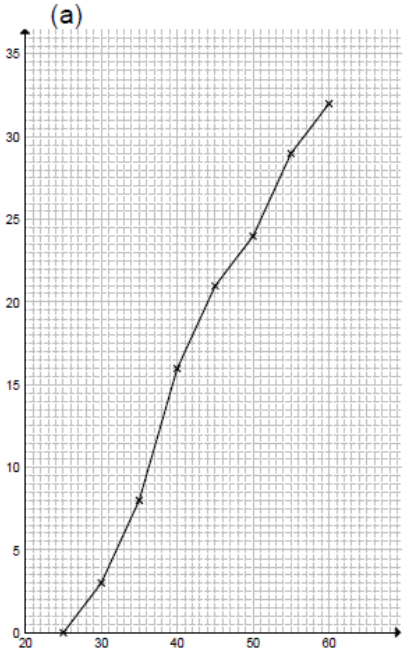
#5

GCSE (9-1) Mathematics Component 1: Higher Tier	Mark	
(a) 23 41 50	B1	
(b) 5 points plotted correctly: (20, 0) (30, 8) (40, 23) (50, 41) (60, 50) All points joined with a smooth curve or with line segments	B2 B1	FT 'their cf ' provided cumulative; tolerance ± 1mm B1 for 3 or 4 correct plots dep on at least B1 for plots; last point must not be joined to the axis; tolerance ± 1mm
(c)(i) Gold bonus: Answer in range 53 000 to 55 000 inclusive Silver bonus: Answer in range 45 000 to 47 000 inclusive	B2	FT their cf graph for 'their *s*' when cf is 45 and 35 B1 FT for each If no marks, award SC1 for **both** Gold bonus in range 53 to 55 **and** Silver bonus in range 45 to 47
(c)(ii) Valid explanation e.g. 'The data may not be evenly spread through each group.' or 'All the sales in the group 50 to 60 may be 60 000.' or 'The raw data is not used.'	E1	Allow e.g. 'It is estimated because the data is grouped.' or 'Because you do not know what each salesperson got.'
(d) September and valid evidence/comment e.g. 'The median sales are lower.'	E1	Evidence must be based on the mathematics and with no contradictions
	(8)	

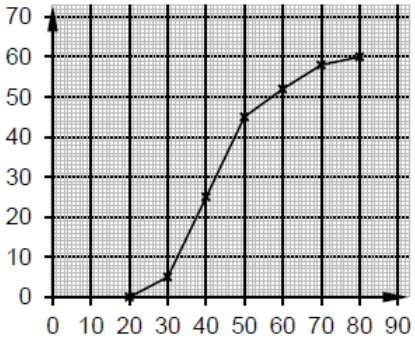
#6

Component 1: Higher Tier	Mark	Comment
(a) Upper quartile = 35	B1	Seen or implied
Left whisker at 12 and right at 40	B1	
LQ 22, median 29 and UQ 35	B1	Must be seen in a correct box plot, FT their UQ; if no UQ is stated and it is not at 35 allow this mark provided 29 < UQ < 40
(b)(i) 210 (students)	B2	B1 for 280 ÷ 4 × 3 or 0.75 × 280 or appropriate sight of 75%
(b)(ii) Explanation, using both range and IQR with correct values, e.g. All three ranges are 28 AND two IQ ranges are 13, and the other is 20	B3	May be seen by the diagrams. Allow B3 for all three ranges are 28 AND only two of the IQR's are 13 provided no incorrect value given for the 20. Award B2 for one of the following: • An answer that would be awarded B3 but the 20 is incorrect. • a correct explanation with errors or omissions in the values given e.g. All three ranges are 27 AND only two IQ ranges are the same. • a correct explanation with no values given e.g. All three ranges are the same AND only two IQ ranges are the same. Award B1 for either: • All three ranges are 28 • the IQ ranges are 13, 20 and 13
(c) Reference to graph indicating that it shouldn't decrease.	E1	
	(9)	

#7

GCSE (9-1) Mathematics Component 1: Higher Tier	Mark	Comment
(a)  	B2	<table><tr><td>40</td><td>45</td><td>50</td><td>55</td><td>60</td></tr><tr><td>16</td><td>21</td><td>24</td><td>29</td><td>32</td></tr></table> B1 for remaining points plotted correctly B1 for all remaining correctly-plotted points joined correctly with straight lines or a smooth curve and no extension beyond (60, 32) If no marks, award SC1 for at least 4 points plotted correctly and joined with straight lines or a smooth curve and no extension beyond (60, 32)
(b)(i) 8	B1	or FT 'their CF diagram'
(b)(ii) 35 40	B1	or FT 'their CF diagram'
(c) (i) Box plot with ends of whiskers at 26 and 60 LQ 35 Median 40 UQ 50	B1 B1 B1 B1	 or FT 'their CF diagram' or FT 'their CF diagram' or FT 'their CF diagram'
(c)(ii) Valid explanation e.g. 'The slowest time could be anything between 55 and 60.' or 'The slowest time could be 58 seconds.'	E1	Must include idea of 'less than'. Allow 'The slowest time could be less than 60.' Do not allow e.g. 'We do not know that anyone took 60 seconds.' (no idea of less than)
(c)(iii) Valid effect on the range e.g. The (actual) range will be smaller. Valid effect on the IQR e.g. The IQR will not change.	E1 E1	Allow e.g. 'It will be smaller.' or 'Eddie's range is bigger than it should be'. Do not allow e.g. 'It makes it bigger.' without reference to this being a comment about Eddie's range.
	(11)	

#8

GCSE (9-1) Mathematics Component 1: Higher Tier		Mark	Comment
(a)	8	B1	
(b)	7 points plotted correctly	B2	B1 for 5 or 6 points plotted correctly tolerance ± 1mm
	All points joined with a smooth curve or with line segments	B1	last point must not be joined to the axis; tolerance ± 1mm 
(c)	(median =) 42 to 43	B1	FT 'their attempt at a cf diagram'
	(IQR =) 50 – 35	M1	FT 'their graph' for lower quartile; Upper quartile must be exact as it is a given value
	15	A1	
(d)(i)	22	B2	Award B1 for ½ × 20 × 1.6 or 30 × 0.2 or sight of 16 or 6 If B0 then SC1 for misreading scale, (½ × 20 × 1.7 + 30 × 0.4 =) 29
	(22 – 8 =) 14	B1	FT 'their 22' – 'their 8' from part (a); provided at least one mark previously awarded
(d)(ii)	Valid explanation e.g. 'No as she has not asked sufficient people.' or 'No as she has only asked technology students.' or 'She only asked them about 1 day'	E1	
		(11)	

Cumulative Frequency & Box Plots: Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	5	
#3	6	
#4	7	
#5	10	
Total	31	

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Marking Scheme

#1

Component 2: Higher Tier	Mark	Comments
<table><tr><th>Range</th><th>Median</th><th>LQ</th><th>UQ</th><th>IQR</th></tr><tr><td>34</td><td>174</td><td>168</td><td>186</td><td>18</td></tr></table>	B3	If IQR not 18, FT IQR from 'their UQ-LQ' B2 for 4 correct values OR B1 for correct values for any one of the following: • Range • Median and IQR • LQ and UQ
	(3)	

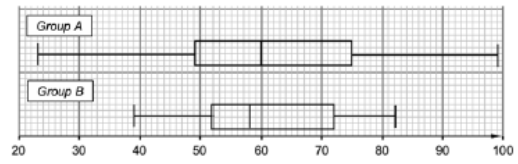
#2

Component 2: Higher Tier	Mark	Comment
(a) Correct box plot with: Median at 19.4 Lower quartile at 16.8 Upper quartile at 21.0 Left whisker to 15.2 Right whisker to 23.2	B3	B1 for UQ = 21(.0) si; may not be in a box plot B1 for LQ, Median, UQ positioned correctly in a box plot, B1 for correct whiskers
(b)(i) Correct indicated and valid explanation e.g. 'The median for group *B* is lower.' or 'The median (for group *A* is 19.4 and) for group *B* is 18.8.'	E1	
(b)(ii) Not correct indicated and valid explanation e.g. 'The lower quartile for *B* is more than 17 but the lower quartile for *A* is less than 17.'	E1	Allow: Not correct and 'Group A had a lower quartile less than 17'
	(5)	

#3

GCSE (9-1) Mathematics Component 2: Higher Tier	Mark	Comment
(a) Yes indicated, or implied, with a valid reason referencing 60 and 74 e.g. 'The median (time playing video games) for 14-year-olds is 74 minutes and the median (time playing video games) for 10-year-olds is 60 minutes.' 'The median for 14-year-olds is 14 (minutes) larger (than the median for 10-year-olds).' May be in two separate statements	E1	Check diagrams for values. Allow e.g. 'The average (time playing video games) for 14-year-olds is 74 minutes and the average (time playing video games) for 10-year-olds is 60 minutes.' '50% of 10-year-olds spent 60 minutes or more, whereas 50% of 14-year-olds spent 74 minutes or more'. '74 is greater than 60.' Do not allow e.g. 'The median for 14-year-olds is 74 minutes and the median for 10-year-olds is 72 minutes.' 'The median for 14-year-olds is bigger than the median for 10-year-olds' unless both medians seen on the diagrams.
(b)(i) 25	B1	
(b)(ii) $\frac{80-76}{80}$ (× 100) 5	M1 A1	 Answer line takes precedence. If no marks awarded, award SC1 for 95%.
(c) IQR (for 10-year-olds) = 44(minutes) AND IQR (for 14-year-olds) = 76(minutes) With a valid conclusion e.g. '14-year-olds have a bigger variation/spread of times (spent playing video games) than 10-year-olds.'	E2	Check for values given on the diagrams Allow use 'range' instead of IQR in the conclusion for E2 or E1 E1 for both correct values for the IQR without a conclusion or with an incorrect conclusion. OR E1 for one IQR correctly and the other incorrectly calculated with the correct FT conclusion. Do not allow e.g. 'The number of 14-year-olds (who played videogames) is more varied as the IQR is higher'
	(6)	

#4

Component 2: Higher Tier	Mark	Comment
(a)(i) Mark | f | cf $0 < p \leq 20$ | 0 | 0 $20 < p \leq 40$ | 3 | 3 $40 < p \leq 60$ | 20 | 23 $60 < p \leq 80$ | 15 | 38 $80 < p \leq 100$ | 7 | 45	B1	
(a)(ii) Valid explanation e.g. '23 terms include all marks as far as 60'	E1	Allow valid explanations based on 22.5th term. Allow e.g. '23 people less than or equal to 60 and 22 people above 60 Must say more than '60 is in the middle group.' FT 'their 45' providing from one error in arithmetic only
(b)(i) Correct box plot Left whisker 23, LQ 49, median 60, UQ 75 and right whisker 99  	B3	B2 for complete box plot with four correct values B1 for any three values correctly plotted in a box plot or for maximum of 99 seen but not drawn on box plot.
(b)(ii) Valid comment comparing medians e.g. 'On average, Group A did better than Group B as the median was 60 whereas Group A's median was 58' or 'The medians are similar so there is not much difference between the groups.'	E1	Must be a comparison not simply a comment about one group Allow e.g. 'Group A had a higher median (so did better on average)'. 'The average of group A is two marks higher' 'Group A had a higher average of 60' as clearly using the median as the average. Do not allow e.g. 'Group A had a median of 60 and Group B had a median of 58.' (no comparison) 'The medians are similar' without further explanation. 'On average Group A were better', (no reference to median or comparison of values).
Valid comment comparing IQRs or ranges e.g. 'Group B's results were less varied than Group A's as the IQR was 20 which was less than Group A's which was 26' or 'Group B's results were more consistent than Group A's as the range was 43 compared to Group A's range of 66.'	E1	Must be a comparison not simply a comment about one group Allow e.g. 'Group B's marks were more consistent as the IQR is smaller' Do not allow e.g. 'Group A had a range of 76 and Group B had a range of 43.' (no comparison) Do not allow if values contradict the statement e.g. 'Group B has lower range, only 20 but A's range is 26' need IQR not range here.
	(7)	

#5

Component 2: Higher Tier	Mark	Comment
(a)(i) A value between 39 and 40 (mins) inclusive	B1	
(a)(ii) Intention UQ – LQ using readings for 37.5 and 12.5 (pupils) 50 to 51 (minutes) and 30 to 31 (minutes) Answers in the range 19 to 21 (minutes) inclusive.	M1 A1	If no marks and a median of 43 to 44 seen in (a) award SC2 answers of 33 to 34 (from LQ and UQ at frequencies of 15 and 45 respectively)
(a)(iii) $\frac{7}{50}$ (× 100) = 14 (%)	M1 A1	If no marks, award SC1 for an answer of 86 (%) If use of 60 as total frequency already penalised award SC2 for an answer of 28(.33…%) or SC1 for $\frac{17}{60}$ (× 100) or an answer of 71.66.. or 72%
(b) Left whisker at 12 and right at 65 UQ 55 UQ 55, median 45 and LQ 31 in a box plot	B1 B1 B1	 Seen or implied. Must be seen in a correct box plot, FT their UQ; if no UQ is stated and it is not at 55 allow this mark provided 45 < UQ < 65.
(c) Valid comment comparing medians e.g. 'On average, School A were quicker than School B as the median was 39.5 in school A and 45 in School B.' 'On average, School B were slower than School A as the median was 39.5 in school A and 45 in School B.'	E1	FT their median and IQR from (a) Must be a comparison not simply a comment about one school. Allow e.g. 'School A had a lower median (so were quicker on average)'. 'The average of School A is 5.5 minutes faster'. 'School A had a lower average of 39.5' as clearly using the median as the average. Do not allow e.g. 'School A had a median of 39.5 and School B had a median of 45' (no comparison). 'On average School A were quicker', (no reference to median or comparison of values).
Valid comment comparing IQRs or range e.g. 'School A's results were less varied than School B's as the IQR was 20 which was less than School B's (which was 24)' 'School A's results were more consistent than School B's as the IQR was 20 which was less than School B's (which was 24)' 'School A's results were more varied than School B's as the range is bigger than School B's (which was 53)'	E1	FT "their IQR' from (a)(ii) Must be a comparison not simply a comment about one school. Allow e.g. 'School A's marks were more consistent as the IQR is smaller'. Do not allow e.g. 'School A had an IQR of 20 and School B had an IQR of 24' (no comparison). 'School B's results are more spread out than School A's' (need to mention IQR since range for School A is greater)
	(10)	

Histograms: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	5	
#3	6	
#4	7	
#5	9	
#6	9	
Total	39	

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Marking Scheme

#1

	Mark	Comment
245 CAO	B2	B1 for (1 ×) 140 + 3 × 35; allow if one error in reading the values from the graph e.g. 1 × 140 + 2 × 35 or 1 × 140 + 3 × 40
24.5 (%)	B1	FT provided at least B1 awarded.
	(3)	

#2

Component 1: Higher Tier	Mark	Comment
(a) Any suitable explanation e.g. 'By grouping the data the modal group has changed' 'By grouping the data information has been lost'	E1	Do not accept e.g. 'The data grouping has changed'. 'Alice has combined some groups'
(b) 100 – (18 + 20 + 10 + 12 +10) or 100 – 70 = 30 Histogram completed with group of frequency density 0.3	M1 A1 B1	Check the diagram. Allow one error with the frequencies CAO FT 'their 30' provided M1 awarded or the frequencies seen with at most one error
(c) Any suitable comparison e.g. '(More) Year 11 students spend more time on their phones (than Year 7 students)' '(More) Year 7 students spend less than 200 minutes on their phones (than Year 11 students)'	E1	Do not allow comparisons that include the data from the histograms.
	(5)	

#3

GCSE (9-1) Mathematics Component 1: Higher Tier	Mark	Comment
(b)(i) '0-15' bar drawn with height 0·6	B2	B1 for 9/15 oe seen
(b)(ii) 44	B2	B1 for 10 × 2.6 (=26) OR 20 × 0.9 (=18) Check the histogram
$\frac{44}{110}$ (× 100)	M1	FT 'their 26' + 'their 18' provided one correct and total not equal to 35 (from 26 + 9)
40(%)	A1	On FT the percentage must be given correctly to the nearest whole number or better

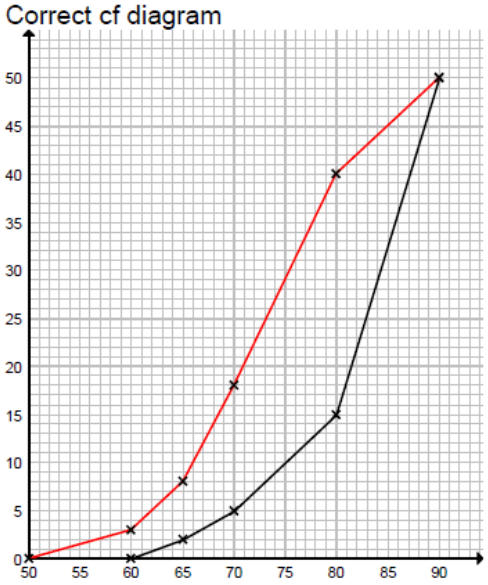
#4

Component 1: Higher Tier	Mark	
(b)(i) Frequency densities: 0·2, 0·9, 1·2, 0·5, 0·4 si	B2	B1 for either: • any 4 correct calculations from 6 ÷ 30, 9 ÷ 10, 12 ÷ 10, 5 ÷ 10, 8 ÷ 20 • any 4 values correctly found.
Fully correct histogram	B2	FT candidate's frequency density for B2 or B1 provided at least 3 frequency densities are correct. B1 for 3 or 4 correct bars; no gaps.
(b)(ii) (0·4 × 30 + 1·5 × 10 + 0·6 × 5)	M1	Check diagram 12 + 15 + 3 or 40 – 0.5 × 0.6 × 10 – 0.7 ×10 or 40 – 3 – 7
– (6 + 9 + 12 ÷ 2)	m1	– 21
9	A1	

#5

Component 1: Higher Tier	Mark	
(a)(i) 0.1, 0.8, 0.4, 1.3, 0.25	B2	Allow fractions e.g. $\frac{5}{50}, \frac{8}{10}, \frac{12}{30}, \frac{13}{10}, \frac{5}{20}$ B1 for 3 or 4 correct Table takes precedence
(a)(ii) Fully correct histogram	B2	FT candidate's frequency density if table has arithmetic errors but the idea of frequency density is used e.g. $\frac{5}{50}, \frac{8}{10}, \frac{12}{30}, \frac{13}{10}, \frac{5}{20}$ si B1 for 3 or 4 correct bars; no gaps
(a)(iii) $\frac{17}{43}$	B2	B1 for $\frac{5+8+(12\div 3)}{43}$ oe OR B1 for 5 + 8 + 4 or 17 seen
(b) $0.4\times 50 + (1\times) 10 + 0.3\times 40 + 0.2\times 20$ 46	M1 A1	20 + 10 + 12 + 4 si; allow one error
(c) Brian indicated with a supporting comparison. e.g. 'Brian has 30 trees less than 260 cm Yvonne has 13.' or 'Yvonne has 5 of the smallest trees and Brian has 20'	E1	FT 'their (b)'; dep on at least M1 in part (b) Allow e.g. 'Brian because he has more trees that are below 260 cm' or 'Brian as he has a greater probability of having trees less than 270' or 'Brian as Yvonne has fewer trees less than 260' or 'Brian has (their) 20 and Yvonne has 5 in the smallest group' Do not allow e.g. 'Brian because most of his trees are shorter than most of Yvonne's' or 'Brian as he has a larger amount of shorter trees'
	(9)	

#6

Component 1: Higher Tier	Mark	Comment
(a) 21 42 (%)	B2 B1	B1 for $5 \times 2.2 + (1 \times) 10$ FT provided at least B1 awarded. If no marks award SC1 for $0.3 \times 10 + (1 \times) 5 + 2 \times 5 + 2.2 \times 10 + (1 \times) 10$
(b) v | $v \leq 50$ | $v \leq 60$ | $v \leq 65$ | $v \leq 70$ | $v \leq 80$ | $v \leq 90$ cf | 0 | 3 | 8 | 18 | 40 | 50	B2	B1 FT for any 2 or 3 unshaded cells correct; FT 'their 3' + 5, 'their 8' + 10, 'their 18' + 22
(c)(i) Correct cf diagram  	B2	FT 'their part (b)' for B2 or B1 provided an attempt at cumulative frequency; may be a curve; lines need not be ruled B1 FT for first 5 points plotted correctly but not joined or for at most 2 incorrectly plotted points which have been correctly joined NB, if correct: (50, 0), (60, 3), (65, 8), (70, 18), (80, 40), (90, 50)
(c)(ii) Sight of numerical evidence Tuesday indicated and valid interpretation using their numerical evidence e.g. 'The median for Tuesday is greater, (so more had a higher greatest speed).' or 'The upper quartile for Tuesday is greater, so the top 25% of drivers drove more quickly.'	E1 E1	e.g. Mon | Tues Median | 73 OR between 70 and 80 | 83 OR between 80 and 90 LQ | 67 | 77 - 78 UQ | 79 | 86 - 87 % ≥ 75mph | 42 (FT part a) | 80 No. > 80mph | 10 | 35
	(9)	

Histograms: Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	7	
#3	8	
Total	18	

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Marking Scheme

#1

GCSE (9-1) Mathematics Component 2: Higher Tier	Mark	Comment
(a) No with valid explanation e.g. 'she has plotted frequency, not frequency density'	B1	Allow No 'it is a bar chart'
(b) 160	B2	B1 for sight of any one of: • 120 ÷ 30 • 1 square represents 4 (patients) oe • Areas in ratio e.g. 30 : 40 • 24 and 16 placed correctly on vertical scale
	(3)	

#2

Component 2: Higher Tier	Mark	Comment
(a) 1.2× 20 + 4.2× 10 + 5× 5 + 3.4× 5 + 0.8× 30 (24 + 42 + 25 + 17 + 24) = 132 (cars) (Estimated median =) 30 (mph)	M1 A1 B1	Allow one slip (e.g. the sum of 5 values with 4 correct) CAO. FT 'their 132' provided M1 awarded A median of 30 from incorrect work or unsupported is awarded no marks. Median = 30 and 24 + 42 = 25 + 17 + 24 oe is awarded all 3 marks If no marks award SC1 for sight of the 5 correct values: 24, 42, 25, 17 AND 24
(b)(i) $\frac{1 \times 10 + 6 \times 5 + 7.2 \times 10 + 2.8 \times 5}{150} \times 100$ (= 84%) or $\frac{150 - (0.5 \times 20 + 2.8 \times 5)}{150} \times 100$	B2	B1 for $1 \times 10 + 6 \times 5 + 7.2 \times 10 + 2.8 \times 5$ (= 126) (10 + 30 + 72 + 14) or $150 - (0.5 \times 20 + 2.8 \times 5)$ $150 - (10 + 14)$
Alternative method 1 *0.84 × 150 = 126 AND* *1 × 10 + 6 × 5 + 7.2 × 10 + 2.8 × 5 = 126* *OR* *150 - (0.5 × 20 + 2.8 × 5) = 126*	*B2*	*B1 for one of the following:* • *1 × 10 + 6 × 5 + 7.2 × 10 + 2.8 × 5 (= 126)* • *150 - (0.5 × 20 + 2.8 × 5) (= 126)* • *0.84 × 150 = 126 AND sight of 5, 30, 72 and 14*
Alternative method 2 *(1 – 0.84) × 150 OR 0.16 × 150 = 24 AND* *150 - (1× 10 + 6× 5 + 7.2× 10 + 2.8× 5) = 24* *OR* *0.5 × 20 + 2.8 × 5 = 24*	*B2*	*B1 for one of the following:* • *150 - 1× 10 + 6× 5 + 7.2× 10 + 2.8× 5 (= 24)* • *0.5 × 20 + 2.8 × 5 (= 24)*
Alternative method 3 $\frac{1\times10+6\times5+7.2\times10}{150}$ *x 100 = 74.66… or 75 (%)* *AND* $\frac{1\times10+6\times5+7.2\times10+2.8\times10}{150} \times 100 = 93(.33..)(\%)$ *AND* *e.g. '84% lies between these values'*	*B2*	*B1 for both percentages attempted with at least one correct*
(b)(ii) A correct explanation e.g. 'Irene cannot be sure that 14 cars in the 4th bar were travelling less than 30mph'. 'More than half of the cars in the 4th bar could have been travelling more than 30 mph'. 'More than half of the cars in the 4th bar could have been travelling less than 30 mph'.	E1	Do not allow e.g. 'The graph does not show the exact number of cars' without further explanation.

(c) Speed bumps selected with a valid reason quoting values from the histograms e.g. 'With 30 mph signs 50% of cars travelled at a speed less than 30 mph, but, with speed bumps 84%* of cars travelled at a speed less than 30 mph'. 'With 30 mph hour signs 50% of cars travelled at a speed more than 30 mph, but, with speed bumps 16% of cars travelled at a speed more than 30 mph'. * Allow 75% to 93% ** Allow 16% to 25%	E1	Allow e.g Speed bumps selected and: 'Less people travel at over 40 mph' 'Less people travel at over 35 mph' 'No one travelled at over 55 mph' 'More people travel at less than 30 mph with the speed bumps' provided supporting evidence seen in (a) AND (b)(i). 'Median speed with speed bumps is lower than with 20 mph signs' provided answer to (a) > 25 Do not allow e.g. 'More people travel at less than 30 mph with the speed bumps' without supporting evidence seen in (a) AND (b)(i). 'There are less people going faster' without reference to values from the graph
	(7)	

#3

Eduqas Summer 2018 C2 Higher Tier Update 130618	**Mark**	**Comment**
(a) 20×4 + ½×10×10 130 (girls)	M1 A1	CAO
(b) Total boys: 20×2+10×15+10×19+10×10+30×1 Boys 510 >1hour: Girls 225 **and** Boys 130 %: Girls (100×) 225/580, OR Boys (100×) 130/510 In order: 38.79….(%) **and** 25.49…(%)	 M1 A1 B2 M1 A1 (8)	 Allow for sight of any three correct products in a sum of 5 products CAO B1 for one correct total FT provided M1 previously awarded FT provided M1 and at least B1 previously awarded Mark final answer, in answer space if completed. Accept 38.8(%) or 39(%) **and** 25.5(%) or 25(%) Do not accept as final answers 38(%) or 38.7(%) **and** 25.4(%) or 26(%), i.e. any rounding must be correct