

Write your name here

Surname

Other names

Centre Number

Candidate Number

Edexcel Award

Statistical Methods

Level 2

Calculator allowed

Wednesday 15 May 2013 – Morning

Time: 1 hour 30 minutes

Paper Reference

AST20/01

You must have:

Pen, HB pencil, eraser, calculator, ruler.

Total Marks

Instructions

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



Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*

Advice

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

Turn over ►

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PEARSON

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1. Here is a list of words used in statistics.

 categorical stratified sample continuous random discrete

Use a word from the list to complete each of the following statements.

(a) The number of people in a car is an example of data. (1)

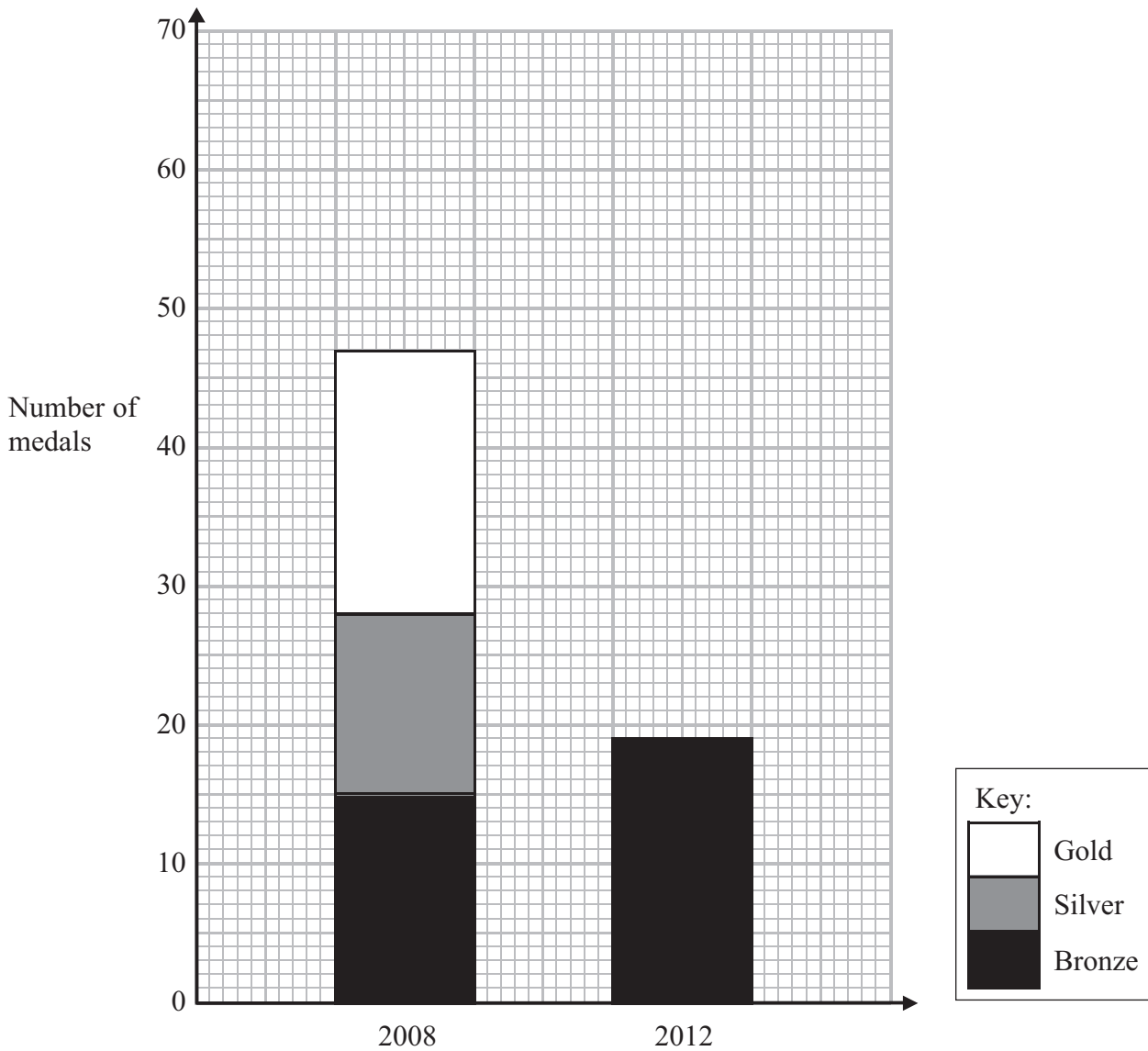
(b) The colour of a car is an example of data. (1)

(Total for Question 1 is 2 marks)



2. The incomplete table and composite bar chart give some information about the number of medals won by Great Britain in the Olympic Games in 2008 and in 2012

	Gold	Silver	Bronze	Total
2008			15	47
2012	29	17	19	65



(a) Use the composite bar chart to complete the table.

(2)

(b) Use the table to complete the composite bar chart.

(2)

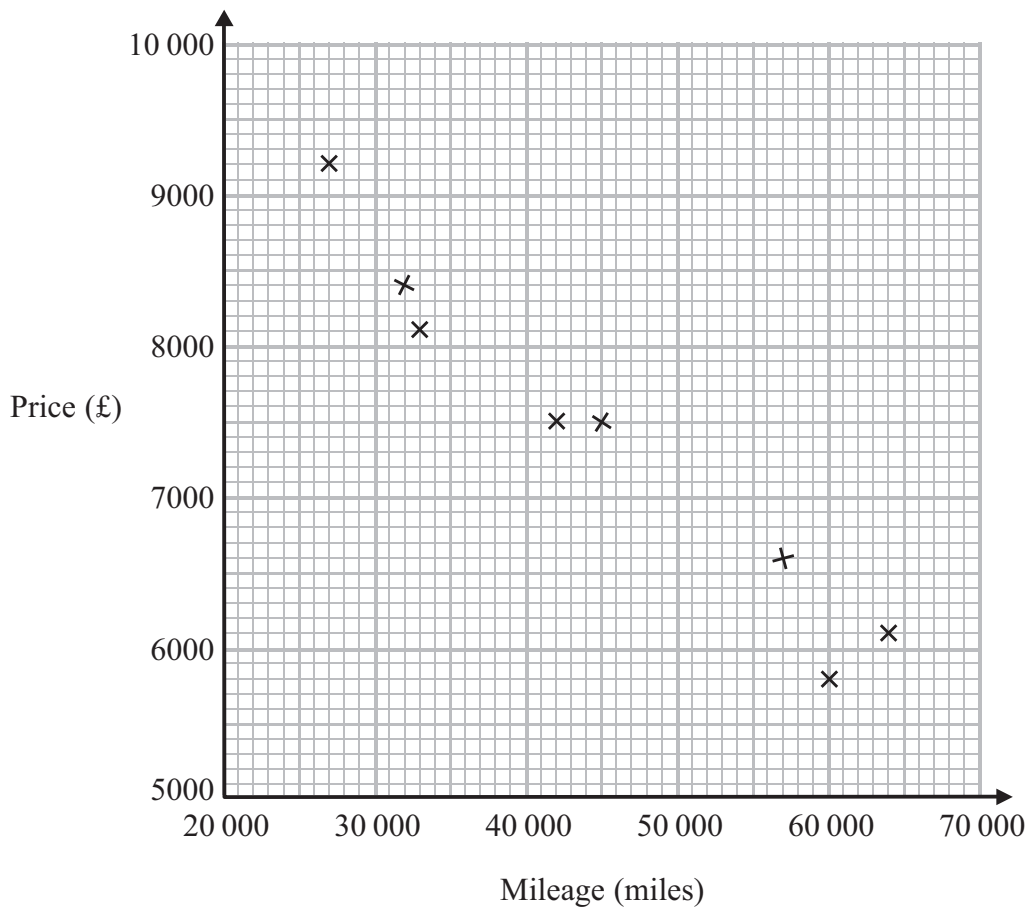
(Total for Question 2 is 4 marks)



P 4 3 6 2 0 A 0 3 2 4

3. Fritz sells used cars in his garage.

The scatter graph shows information about the prices and the mileages of eight used cars sold at the garage.



(a) What type of correlation does the scatter graph show?

..... (1)

The mean point of the data is (44 500, 7400)

(b) On the grid,

(i) plot the mean point,

(ii) draw a line of best fit.

(2)

Another used car sold at the garage has a price of £7000

(c) Find an estimate for the mileage of this used car.

..... miles

(1)

(Total for Question 3 is 4 marks)



4. A pencil case contains red pencils, green pencils, yellow pencils and blue pencils.

Mary takes at random a pencil from the pencil case.

The table shows the probabilities that Mary will take a red pencil, or a green pencil, or a yellow pencil.

Colour	red	green	yellow	blue
Probability	0.25	0.10	0.35	

- (a) Work out the probability that Mary will take a green pencil or a yellow pencil.

.....
(1)

- (b) Work out the probability that Mary will **not** take a red pencil.

.....
(2)

- (c) Work out the probability that Mary will take a blue pencil.

.....
(2)

(Total for Question 4 is 5 marks)



5. Jeremy asked some people how many minutes they each took to get to work.

The table shows some information about his results.

Time taken (t minutes)	Frequency (f)
$0 < t \leq 10$	4
$10 < t \leq 20$	7
$20 < t \leq 30$	9
$30 < t \leq 40$	5

$$\Sigma f = 25$$

(a) Find the class interval which contains the median.

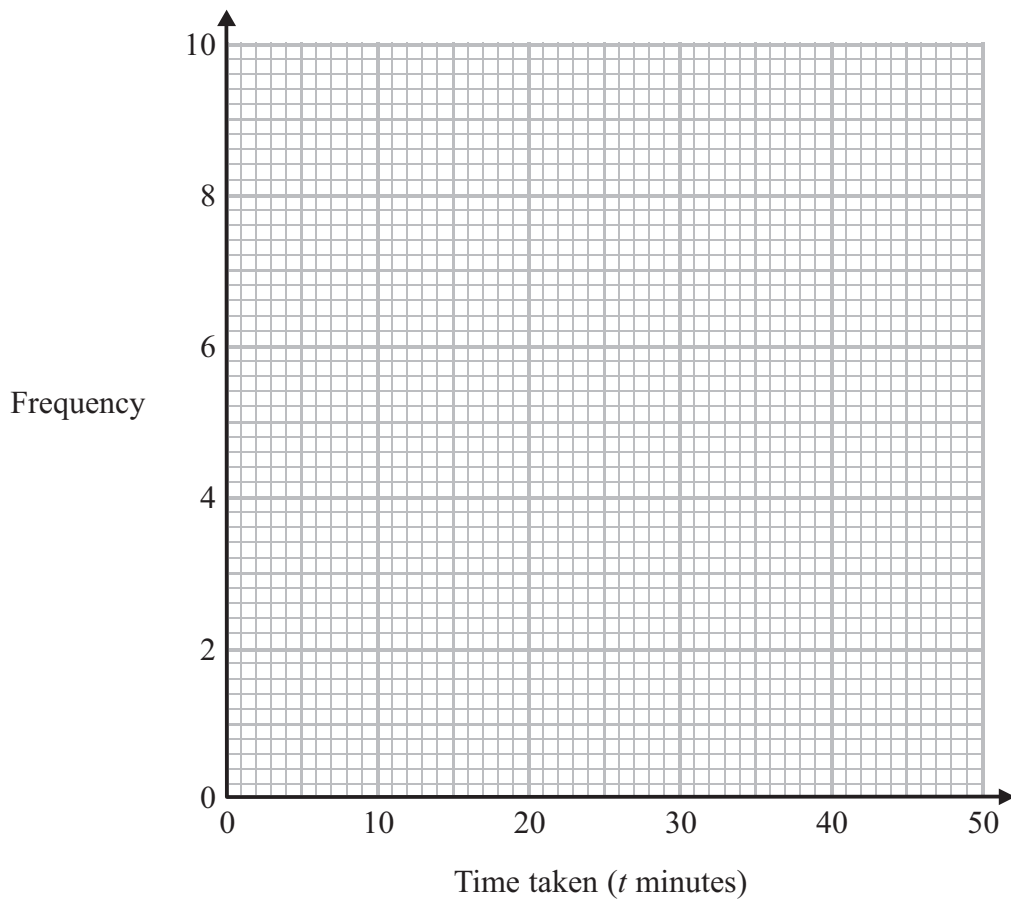
..... minutes
(1)

(b) Work out an estimate for the mean time taken.

..... minutes
(4)



(c) On the grid, draw a frequency polygon to represent the information in the table.



(2)

(Total for Question 5 is 7 marks)



6. John recorded the number of worms in each of 15 samples of soil.
Here are his results.

5	12	17	27	23
30	11	25	21	8
33	25	14	19	25

- (a) Draw an ordered stem and leaf diagram to show this information.

0		
1		
2		
3		

(3)

- (b) Find the median.

.....
(1)

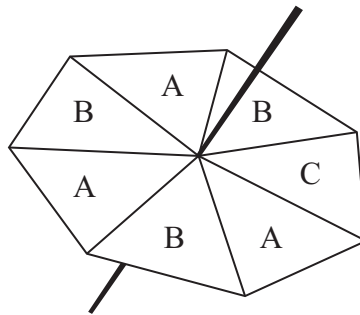
- (c) Work out the interquartile range.

.....
(2)

(Total for Question 6 is 6 marks)



7. The diagram shows a fair 7-sided spinner.



Lola is going to spin the spinner 140 times.

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

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

8. Here are the times taken, in hours, for 10 people to each knit a scarf.

4.9 5.6 5.1 10.5 4.3 4.9 5.7 5.4 4.7 5.3

One of these times may be an outlier.

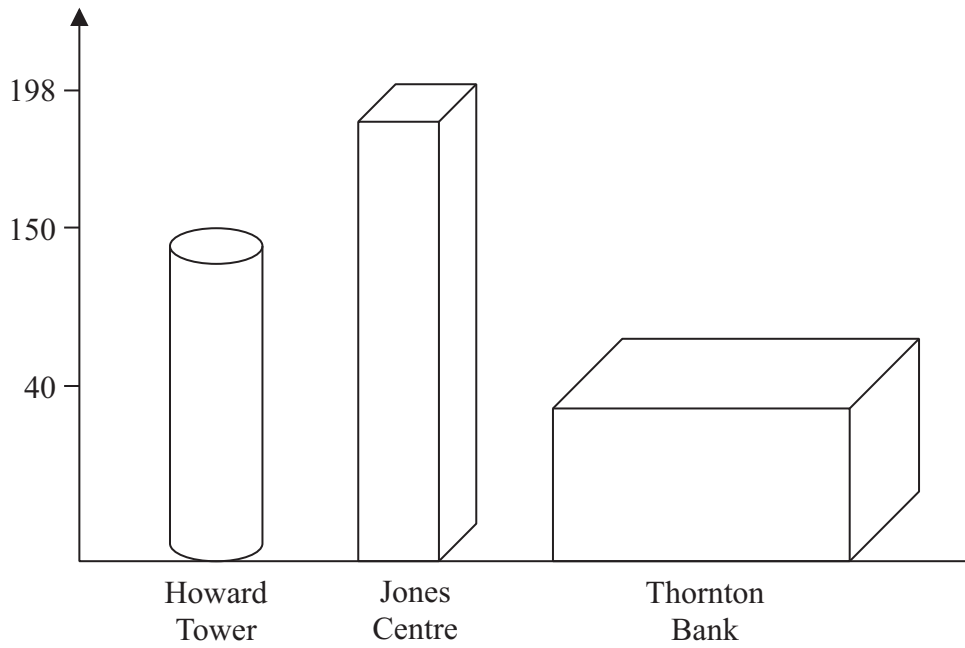
Which time?

Give a reason for your answer.

.....
.....
(Total for Question 8 is 1 mark)



9. The diagram gives information about the heights of some buildings.



Write down three things that could be wrong or misleading in the diagram.

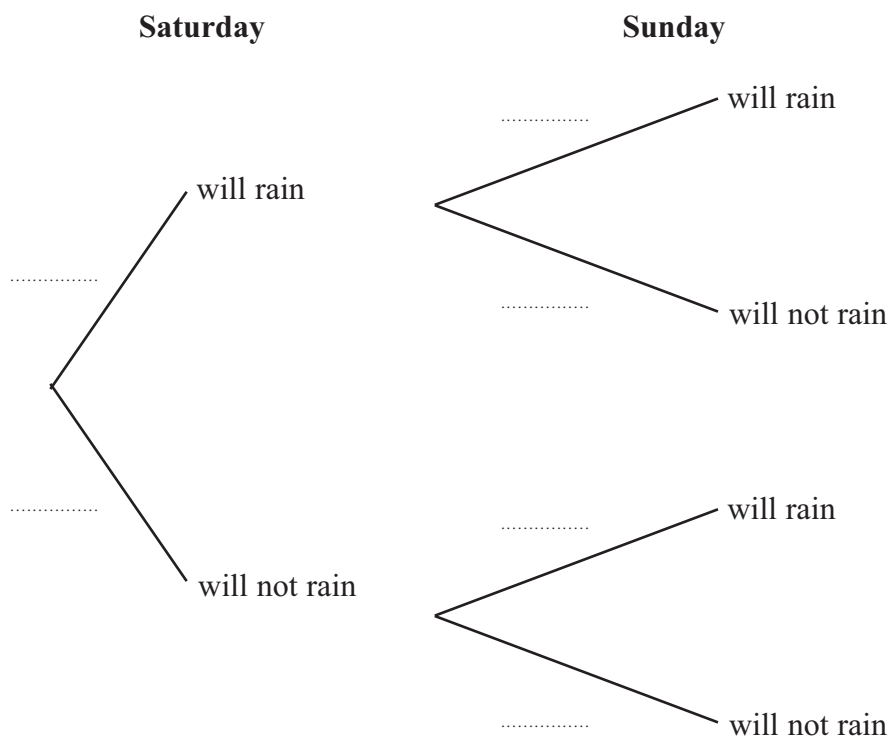
- 1.....
- 2.....
- 3.....

(Total for Question 9 is 3 marks)



10. The probability that it will rain on Saturday is 0.8
 The probability that it will rain on Sunday is 0.4

(a) Complete the probability tree diagram.



(3)

- (b) Work out the probability that it will rain on both Saturday and Sunday.

.....
(2)

- (c) Work out the probability that it will rain on only one of these days.

.....
(2)

(Total for Question 10 is 7 marks)



11. James insures his house in January each year.

The table gives the cost to insure his house in 2010 and in 2011

Year	2010	2011
Cost (£)	236	278

Using 2010 as the base year, work out the index number for the cost of the house insurance in 2011

Give your answer correct to 1 decimal place.

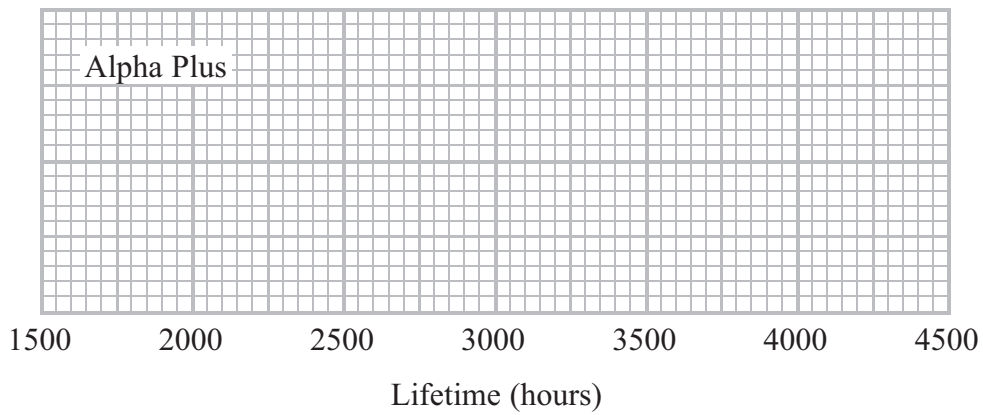
.....
(Total for Question 11 is 2 marks)



12. The table gives some information about the lifetimes of some Alpha Plus light bulbs.

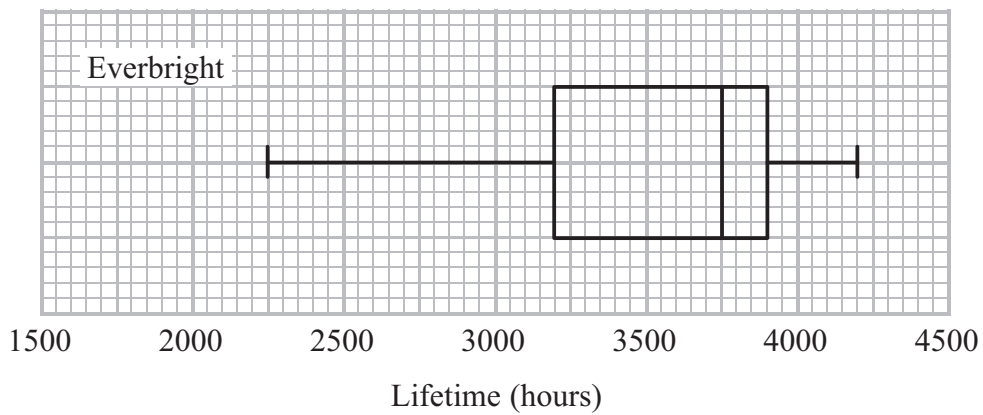
	Lifetime (hours)
Shortest time	1700
Lower quartile	2800
Median	3200
Upper quartile	3600
Longest time	4000

(a) On the grid below, draw a box plot for the lifetimes of these light bulbs.



(3)

The box plot below gives information about the lifetimes of some Everbright light bulbs.



(b) Compare the distribution of the lifetimes of Alpha Plus light bulbs with the distribution of the lifetimes of Everbright light bulbs.

.....

.....

.....

(3)

(Total for Question 12 is 6 marks)



13. The table gives information about the number of people staying in a hotel each quarter in 2011 and in 2012

Year	2011				2012			
Quarter	1	2	3	4	1	2	3	4
Number of people	261	353	372	290	193	309	292	202

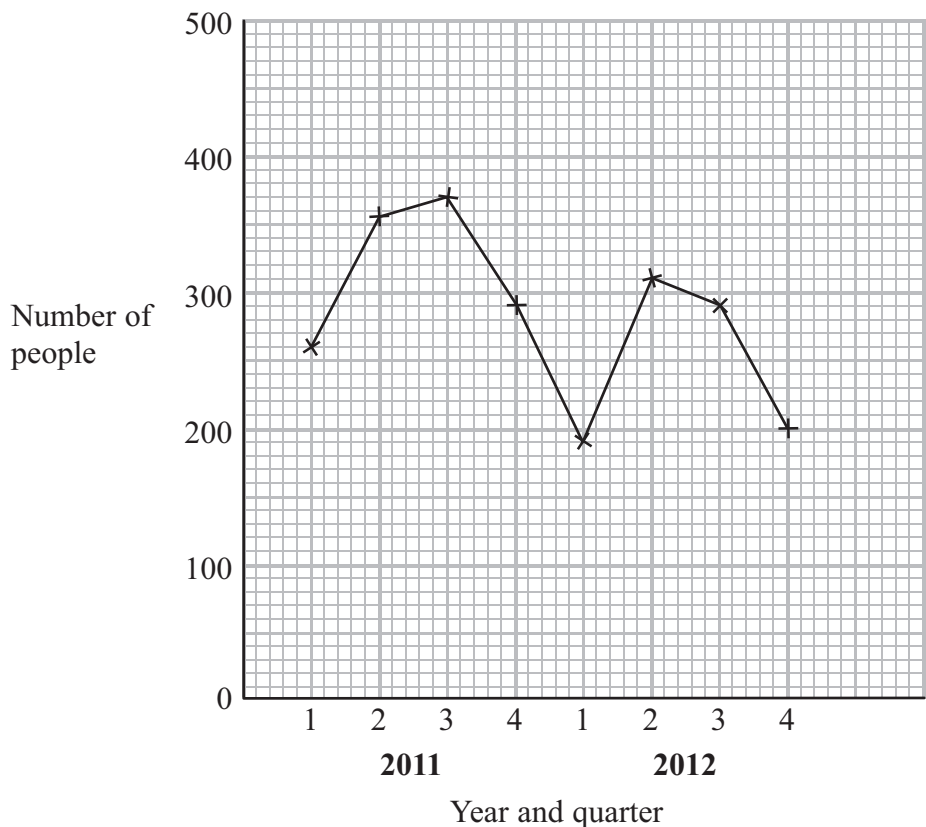
(a) Calculate the 4-point moving averages for this information.

The first three have been done for you.

319, 302, 291, ,
(2)

The information in the table is shown on the grid.

(b) On the grid, plot the 4-point moving averages.



(2)

(c) Describe what the moving averages show about the trend in the number of people staying at the hotel over this period.

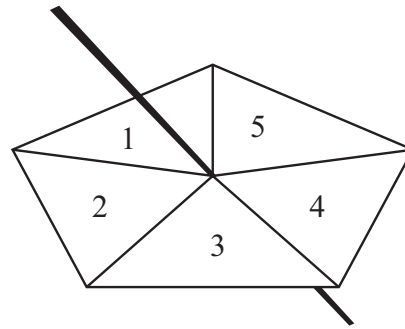
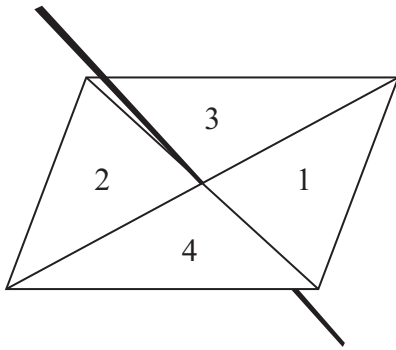
(1)

(Total for Question 13 is 5 marks)



14. Here is a 4-sided spinner and a 5-sided spinner.

The spinners are fair.



(a) Complete the sample space diagram.

		5-sided spinner				
		1	2	3	4	5
4-sided spinner	1	(1, 1)	(1, 2)	(1, 3)	(1, 4)	(1, 5)
	2	(2, 1)				
	3	(3, 1)				
	4	(4, 1)				

(2)

Gary is going to spin each spinner once.
He will find the total of the two numbers he gets.

(b) Find the probability that the total will be less than or equal to 3

.....
(2)

(Total for Question 14 is 4 marks)



15. Dania wants to find out how often the people in her town go to the cinema.

Dania is going to take a sample of the people in her town.

(a) Write down one advantage of taking a sample.

.....
(1)

Dania is going to use a questionnaire to find out how often people go to the cinema.

(b) Design a suitable question for Dania to use in her questionnaire.

You must include some response boxes.

(2)

Dania decides to give the questionnaire to the girls in her class.

(c) Write down two reasons why this may **not** be a good sample.

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

(Total for Question 15 is 5 marks)



16. The time it took each of Zoe, Peter, Mary and Paul to run a race was recorded.

The mean of these times is 12.5 seconds.

Harry also ran the race.

It took Harry 14.0 seconds to run the race.

Work out the combined mean time for all 5 people.

..... seconds

(Total for Question 16 is 3 marks)



17. The table gives information about the heights of some Christmas trees.

Height (h cm)	Frequency
$0 < h \leq 50$	9
$50 < h \leq 100$	14
$100 < h \leq 150$	12
$150 < h \leq 200$	10
$200 < h \leq 250$	5

(a) Write down the modal class interval.

.....
(1)

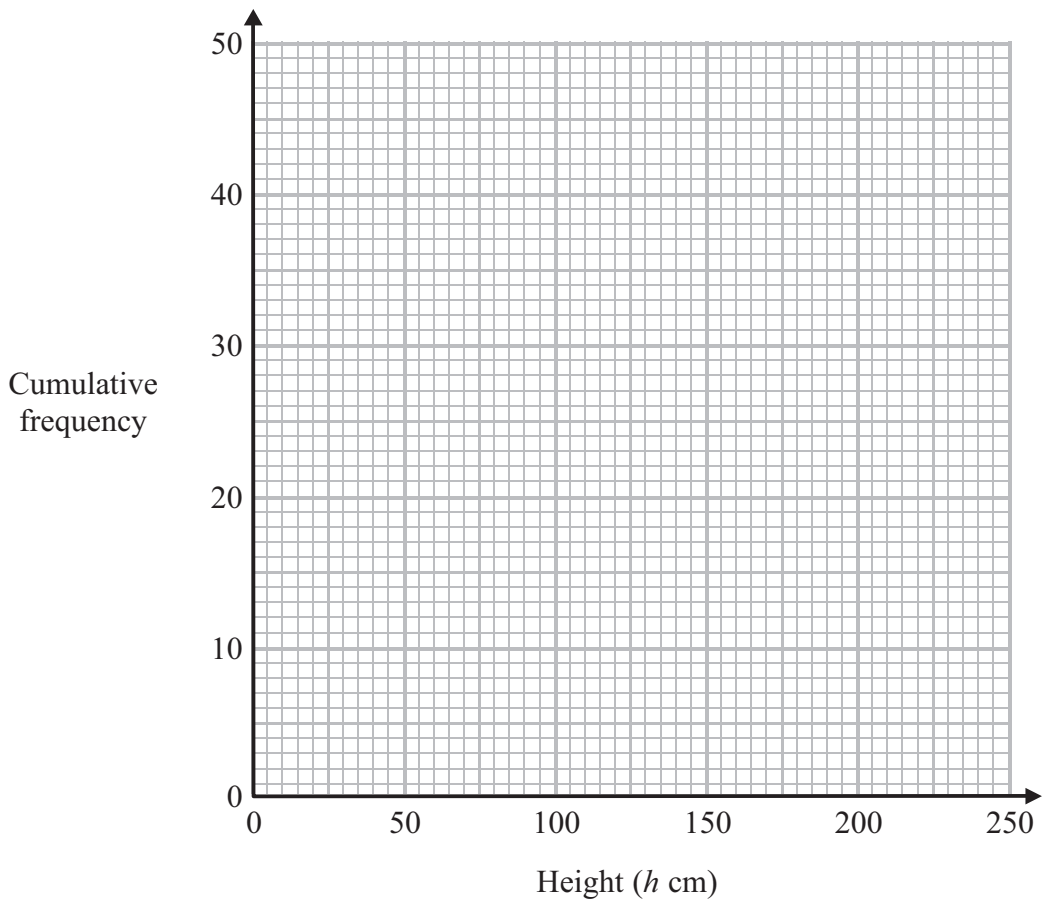
(b) Complete the cumulative frequency table.

Height (h cm)	Cumulative frequency
$0 < h \leq 50$	9
$0 < h \leq 100$	
$0 < h \leq 150$	
$0 < h \leq 200$	
$0 < h \leq 250$	

(1)



(c) On the grid, draw a cumulative frequency graph for your table.



(2)

(d) Use your cumulative frequency graph to find an estimate for

(i) the median,

..... cm

(ii) the interquartile range.

..... cm

(3)

(Total for Question 17 is 7 marks)



18. The table shows the numbers of 1-bedroom, 2-bedroom, 3-bedroom and 4-bedroom homes in a village.

Number of bedrooms	1	2	3	4
Number of homes	79	436	286	178

Jeff takes a sample of 50 of these homes stratified by number of bedrooms.

Work out the number of 3-bedroom homes he should have in his sample.

.....
(Total for Question 18 is 2 marks)

19. Bill wants to find out if his dice is biased.
He rolls the dice 60 times.

The table gives information about his results.

Score	1	2	3	4	5	6
Frequency	4	8	8	12	10	18

Bill's dice may be biased.

Explain why.

.....
.....
.....
(Total for Question 19 is 1 mark)



20. Here are the weights, in kilograms, of five babies.

2.69 3.44 4.52 3.47 3.20

Find the standard deviation of these weights.

You must show your working.

Give your answer correct to 3 significant figures.

..... kg

(Total for Question 20 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS



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