

XXXX/XX

1F

Edexcel GCSE

Statistics

Sample Assessment Material

DRAFT

Time: 1 hour and 30 minutes

Materials required for examination

Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, electronic calculator.

Items included with question papers

Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature. Check that you have the correct question paper. Answer **ALL** the questions. Write your answers in the spaces provided in this question paper.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. (2). This paper has 14 questions. The total mark for this paper is 80. There are 24 pages in this question paper. Any blank pages are indicated. Some questions must be answered with a cross in a box [X]. If you change your mind about an answer, put a line through the box [~~X~~] and then mark your new answer with a cross [X].

Advice to Candidates

Work steadily through the paper. Do not spend too long on one question. Show all stages in any calculations. If you cannot answer a question, leave it out and attempt the next one. Return at the end to those you have left out.

NXXXXXX

W850/.../57570

Foundation Tier Formulae

You must not write on this page.
Anything you write on this page will gain NO credit.


$$\text{Mean of a frequency distribution} = \frac{\sum fx}{\sum f}$$


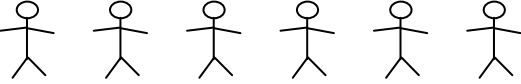


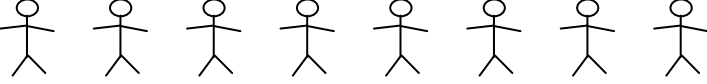
$$\text{Mean of a grouped frequency distribution} = \frac{\sum fx}{\sum f}, \text{ where } x \text{ is the mid-interval value.}$$

Answer ALL of the questions. Write your answers in the spaces provided.

You must write down all stages of your working.

1. The pictogram shows the number of people who visited Woodley Post Office in one week.
The pictogram is not complete.

Key  = 20 people
--

Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	

Forty people visited the post office on Wednesday.

- (a) Complete the pictogram for Wednesday. (1)

- (b) Write down the day on which the most people visited the post office.
 (1)

- (c) Write down the number of people who visited the post office on **Friday**.
 (1)
(Total 3 marks)

2. Arla Foods employs 79 drivers.

The table gives information about these 79 drivers.
The table is not complete.

	Day shift	Night shift	Total
Tanker drivers	22	8	30
Van drivers	37	12	
Total			79

Source: Arla Foods, Wythenshawe

(a) Complete the table.

(2)

The Ministry of Transport checks the number of hours worked by one of these drivers picked at random.

(b) Write down the probability that this driver will be:

(i) a tanker driver,

.....

(1)

(ii) a van driver who works on the night shift.

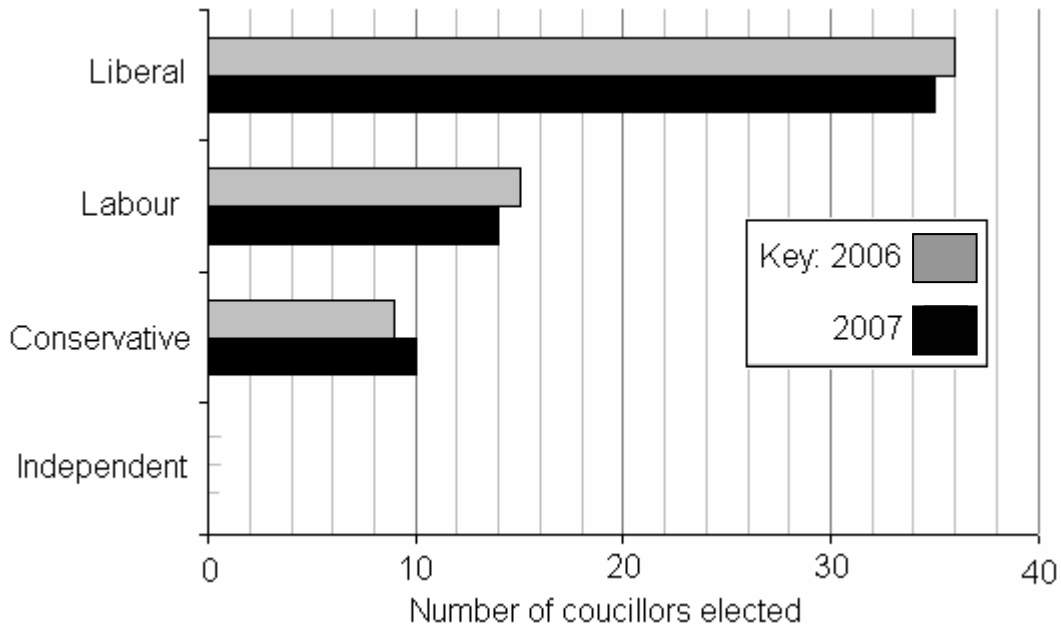
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(1)

(Total 4 marks)

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3. The chart gives information about councillors elected to Stockport Council in 2006 and in 2007.
 It shows the number of councillors elected in each of the political groups.
 The chart is incomplete.



Source: Stockport Council

There were 4 independent councillors in 2006.
 There were 3 independent councillors in 2007.

- (a) Use this information to complete the chart. (2)

- (b) Write down the name of the political group with the highest number of councillors elected in 2006 and 2007.

- (c) Write down the names of the **two** political groups with **fewer** councillors elected in 2007 than in 2006.

- (d) Work out the total number of Conservative and Independent councillors elected in 2007.

(2)

(e) Use the chart to comment on the changes in Stockport Council over these two years.

.....
.....
.....

(2)
(Total 8 Marks)

4. The table shows the total rainfall for each quarter year from 2005 to 2007 at Eastbourne.
The table is incomplete.

Year	Quarter	Rainfall (mm)	4-Point moving Average
2005	1	119	
	2	106	
			$(119+106+153+234)/4 = 153$
	3	153	
			$(106+153+234+155)/4 = 162$
	4	234	
		$(153+234+155+110)/4 = 163$	
2006	1	155	
			$(234+155+110+166)/4 = 166$
	2	110	
			$(155+110+166+271)/4 = 175$
	3	166	
			$(110+166+271+232)/4 = 195$
	4	271	
		$(166+271+232+150)/4 = 205$	
2007	1	232	
	2	150	
	3	151	
	4	187	

Source: Eastbourne Borough Council

- (a) The first seven 4-point moving averages have been worked out.

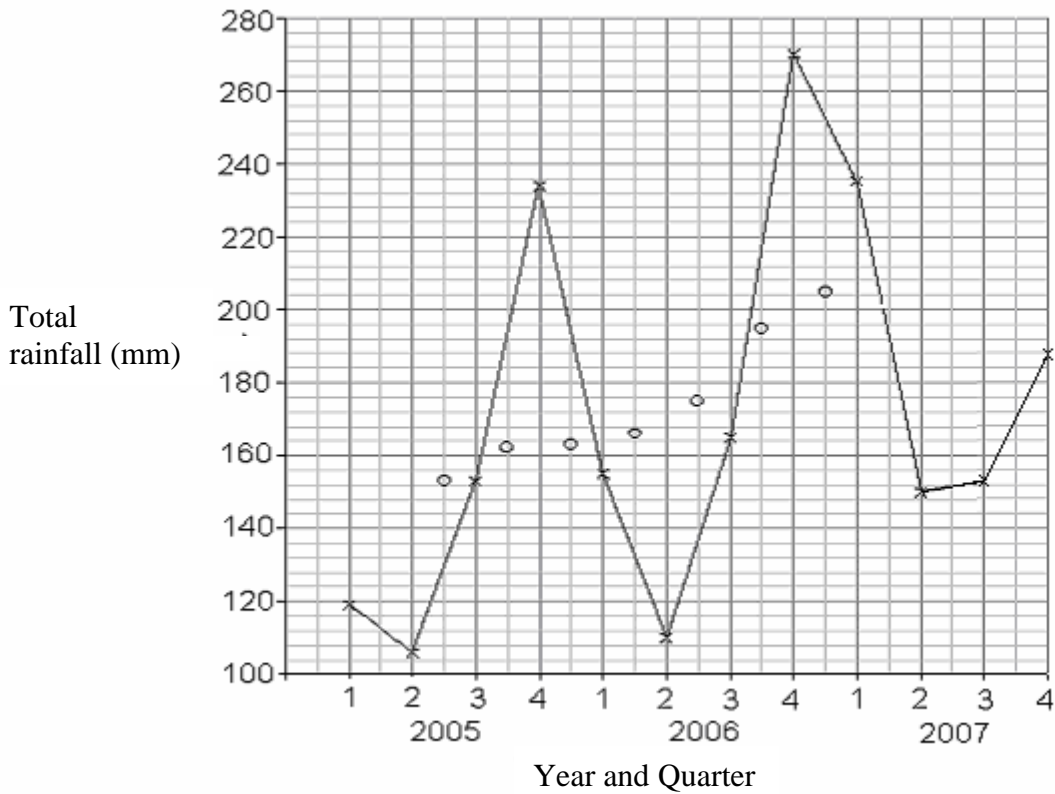
(i) Complete the table to show the last **two** 4-point moving averages.

(2)

(ii) Plot these **two** moving averages on the time series graph.

(2)

Rainfall in Eastbourne



Ali is planning to visit Eastbourne.
She wants to go when there is least rainfall.

(b) In which quarter does Eastbourne have the least rainfall?

.....

(1)

(c) Draw a trend line on the graph.

(1)

(d) Describe the trend in the rainfall from 2005 to 2007.

.....

(1)

(Total 7 marks)

5. Sarah is interested in how people travel to work.
She does a survey of all the people employed by her company.

She records the following data for each person

- A The type of transport they used,
- B The distance they travelled to work,
- C The number of times they were late for work.

(a) Put a cross in **one** box in each table below to show which data can be described as

(i) continuous data

The type of transport they used	<input type="checkbox"/>
The distance they travelled to work	<input type="checkbox"/>
The number of times they were late for work.	<input type="checkbox"/>

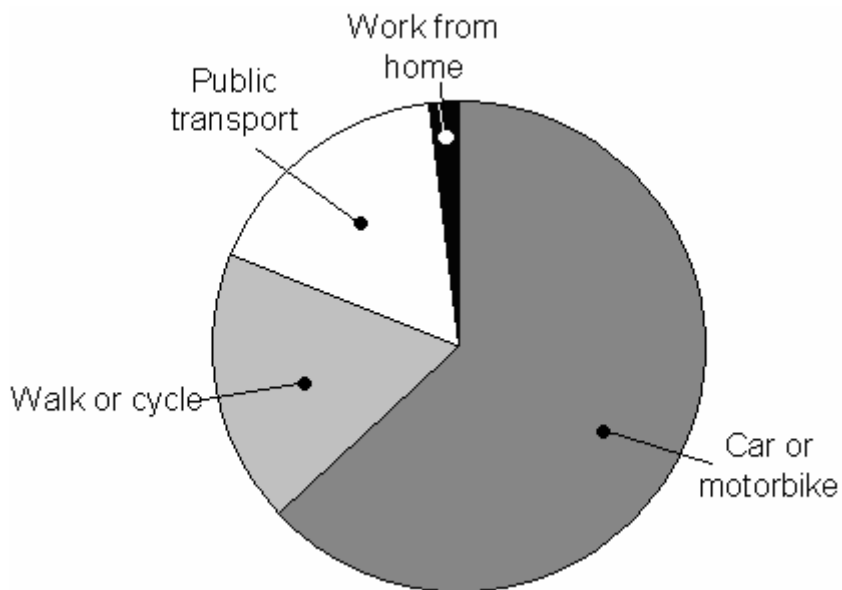
(1)

(ii) qualitative data.

The type of transport they used	<input type="checkbox"/>
The distance they travelled to work	<input type="checkbox"/>
The number of times they were late for work.	<input type="checkbox"/>

(1)

The pie chart shows some information about how people in the UK travelled to work in 2007.

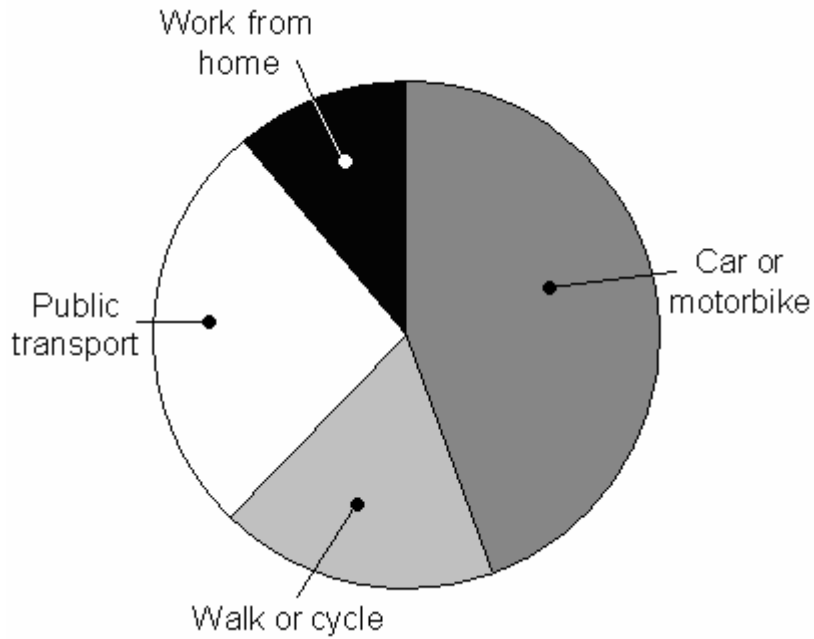


Source: Department for Environment, Food and Rural Affairs.

(b) Write down the most common method of travelling to work.

.....
(1)

The pie chart below shows information about how people from Sarah's company travel to work.



(c) Use the pie charts to compare how people travel to work at Sarah's company with how people travel to work in the whole of the UK.

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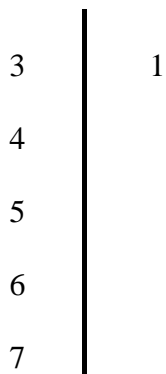
(2 marks)
Total 5 marks

6. The data below shows the average life expectancy, to the nearest year, of females in 11 countries in the Southern hemisphere.

31 39 56 61 62 71 71 71 72 45 69

Adapted from source: World Health Organisation

(a) Use these data to complete the stem and leaf diagram below.



Key
3|1 = 31 years

(3)

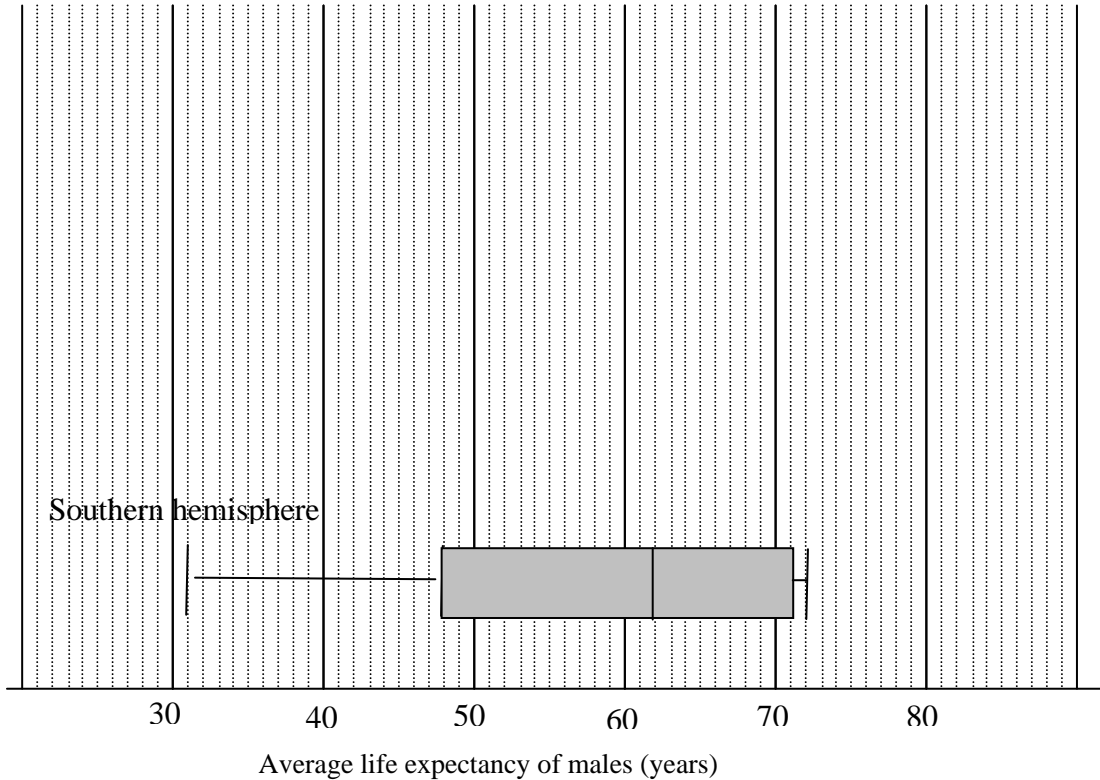
(b) Work out the median of these data.

.....
(1)

(c) Work out the range of these data.

.....
(1)

The box plot shows information about the average life expectancy of males in some countries in the **Southern hemisphere**.



Source: World Health Organisation

The table gives information about the average life expectancy, in years, of males in some countries in the **Northern hemisphere**.

Minimum	Lower quartile	Median	Upper quartile	Maximum
48	62	72	78	79

(d) On the grid above, use this data to draw a box plot to show the distribution of average life expectancy for males in these countries in the **Northern hemisphere**. (3)

(e) Compare the distributions of the average life expectancy of males in the **Southern hemisphere** with the average life expectancy of males in the **Northern hemisphere**.

.....

.....

.....

.....

.....

(2)

(Total 10 marks)

7. A supermarket manager wants to find out information about the vehicles going into the supermarket car park.

The vehicles are to be classified as Small cars, Large cars, Vans and Other.

(a) Design a data collection sheet which could be used to record how many of each of these types of vehicles go into the car park.

(1)

The car park attendant collects information about cars entering the car park.

He stands by the entrance of the car park at 10am on one Tuesday for one hour.

(b) Give **one** reason why this survey method may not give representative results.

.....

.....(1)

(Total 2 marks)

8. The table gives information about the water resources and populations of seven countries in 2000.

Country	Renewable freshwater resource (m ³ /yr per person)	Population (millions)	Shortfall in freshwater (km ³ /yr)	Ocean coastline (approx.) km	Freshwater potential from wave powered desalination	
					km ³ /yr	% of shortfall
Antigua	800	0.07	0.06	40	0.2	333
Barbados	307	0.27	0.38	40	0.2	53
Kenya	985	30.7	22	400	9.7	44
Morocco	971	29.9	21.8	1100	3.5	16
Oman	388	2.5	3.3	600	2.1	64
Somalia	1538	8.8	1.4	1600	8.4	600
South Africa	1154	43.3	23.6	700	7.1	30

Source: Adapted from P A Davies School of Engineering University of Warwick

(a) Write down the name of the country that had the biggest population.

.....
(1)

(b) Write down the name of the country that had the largest amount of renewable freshwater resource per person

.....
(1)

(c) Write down the names of the **two** countries that **could** supply all of their shortfall in freshwater from wave powered desalination.

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

(Total 4 marks)

9. The time taken, in seconds, to answer each of 46 telephone calls to a call centre were recorded.

This information is summarised in the frequency table below.

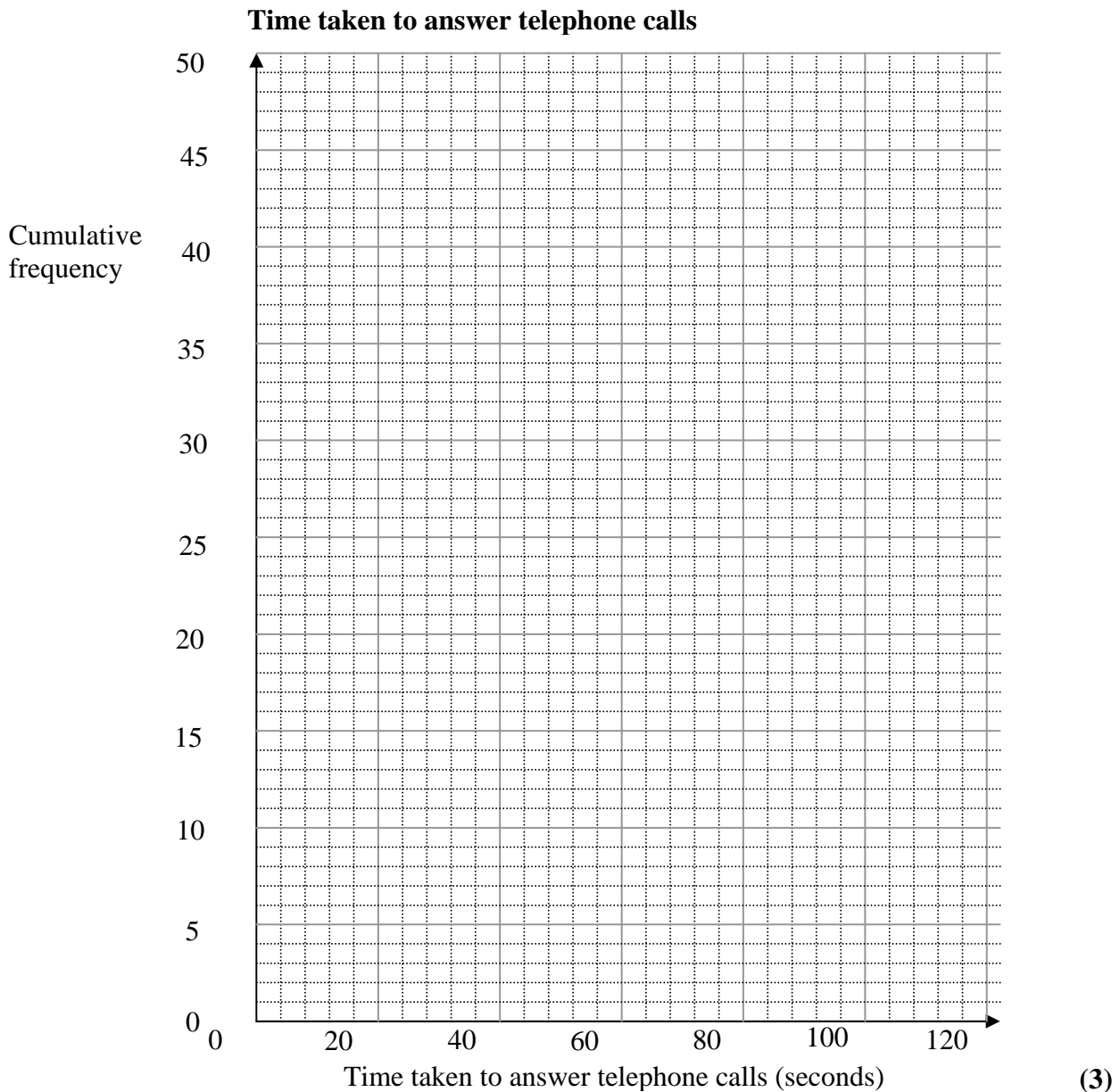
Number of seconds	Frequency
$0 < t \leq 20$	7
$20 < t \leq 40$	17
$40 < t \leq 60$	14
$60 < t \leq 80$	5
$80 < t \leq 100$	2
$100 < t \leq 120$	1

- (a) Complete the cumulative frequency table below for these data.

Number of seconds	Cumulative frequency
$0 < t \leq 20$	7
$0 < t \leq 40$	
$0 < t \leq 60$	
$0 < t \leq 80$	
$0 < t \leq 100$	
$0 < t \leq 120$	

(2)

(b) On the grid, draw a cumulative frequency diagram for these data.



(c) Use your cumulative frequency diagram to find an estimate for the median number of seconds taken to answer these telephone calls. (3)

..... (2)

The call centre aims to answer telephone calls within 30 seconds.

(d) Is the centre achieving this aim?
Give a reason for your answer.

.....
.....
.....

(2)
(Total 9 marks)

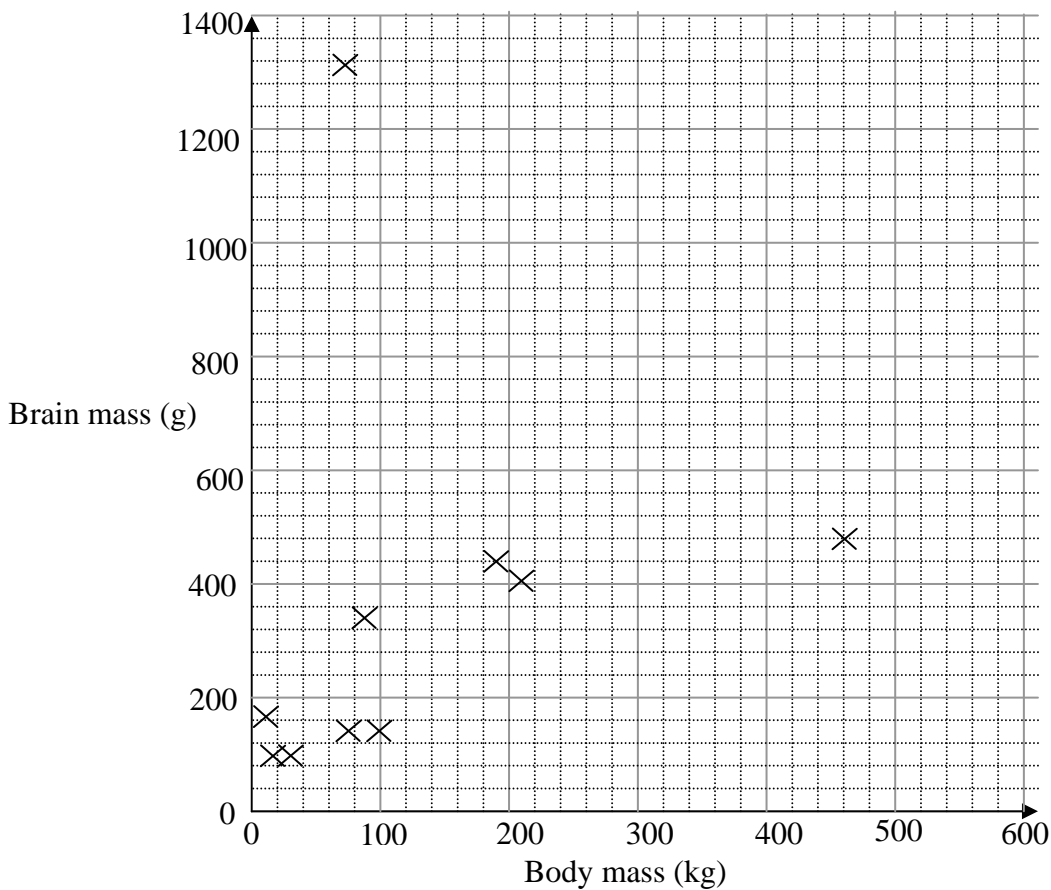
10. The table gives information about the average body mass and average brain mass of ten mammals.

Large mammal	Average body mass (kg)	Average brain mass (g)
Baboon	10.55	179.5
Cow	460	440
Deer	14.83	98.2
Donkey	187.1	419
Goat	27.66	115
Gorilla	207	406
Jaguar	100	157
Human	62	1320
Seal	85	325
Sheep	55.5	175

Source 'Sleep in Mammals: Ecological and Constitutional Correlates' (1976).

These data are shown on the scatter diagram.

Body mass and brain mass of mammals



Horses have an average body mass of 520 kg and an average brain mass of 640 g.

(a) Plot this new information on the scatter diagram. (1)

(b) Write down the name of the mammal that does not fit the overall pattern.
..... (1)

(c) Ignoring the mammal in part (b),
(i) Draw, by eye, a line of best fit on the diagram. (1)

(ii) For these data, describe and interpret the correlation.
.....
.....
..... (2)

A pig has an average brain mass of 400 g.

(d) Using your line of best fit estimate the average body mass of a pig.
.....kg (1)

A mammal has an average body mass of 600 kg.

(e) (i) Estimate the average brain mass of the mammal.
.....g (1)

(ii) Give a statistical reason why your estimate might be unreliable.
.....
.....
..... (1)

(Total 8 Marks)

11. The local council is planning to build a new swimming pool.

The councillors want to get the views of the local people.

Councillor Green wants to take a census of the population of the town.

(a) (i) Give **one** advantage of taking a census.

..... (1)

(ii) Give **one** disadvantage of taking a census.

..... (1)

Councillor Smith suggests taking a sample from the people who attend the local sports centre.

(b) Explain why this would not be a representative sample.

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

Councillor Singh suggests taking a simple random sample of 100 people.

(c) Describe, in detail, how the council could take a simple random sample.

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

The council cannot agree whether to use face-to-face interviews or to use a questionnaire.

(d) (i) Give **one** advantage of using face-to-face interviews.

.....(1)

(ii) Give **one** disadvantage of using face-to-face interviews.

.....
(1)

The council decided to use a questionnaire.

Councillor Liu suggests they ask the question,
'Do you agree that a new swimming pool would be a good idea?'
This is a leading question.

(e) Rewrite the question so that it is not leading.
(Remember to include answer boxes.)

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

(Total 9 marks)

12. In a series of air races, the pilots are awarded points based on their final position in each of ten races.

Paul is awarded 8, 9 or 10 points in each of his first nine races.

In his final race he makes a mistake and is awarded 0 points.

He wants to work out his average number of points.

(a) Write down **one** advantage to him of using the median.

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

The range of Paul's points is 10

The range is not a fair measure of spread for his points.

(b) (i) Write down another measure of spread he could use.

.....
(1)

(ii) Write down **one** advantage this new measure has that the range does not have.

.....
(1)
(Total 3 marks)

- 13** The cost of some groceries in June 2007 was £80
The cost of the same groceries in July 2007 was £81.60
June 2007 is the base month.

Month	June 2007	July 2007
Cost of groceries (£)	80	81.60
Index number	100	

- (a) Work out the index number for the cost of the groceries in July 2007.

.....
(2)

The Index number for the cost of the same groceries in August 2007 is 103

- (b) Work out the cost of the groceries in August 2007.

.....
(2)

The index number for September 2007 was 102.5

- (c) Comment on how the price of the groceries changed between August 2007 and September 2007.

.....
.....
(1)
(Total 5 marks)

14. Mary collects data on some people’s arm measurements.

She measures the length from their shoulder to their fingertip.
 She also measures the length from their elbow to their fingertip.

She suggests the following hypothesis,

$$\text{Arm length ratio} = \frac{\text{Length from shoulder to fingertip}}{\text{Length from elbow to fingertip}} = 1.6$$

Mary did this calculation for each of 15 males and 15 females.

Her results are summarised below.

Arm length ratio

	Lower quartile	Median	Upper quartile
Males	1.60	1.68	1.74
Females	1.58	1.63	1.72

(a) What conclusion could you draw about Mary’s hypothesis from these data?
 Give a reason for your answer.

.....

(2)

(b) What could Mary do to improve the quality of her investigation?

.....

(1)

(Total 3 marks)

END

TOTAL FOR PAPER: 80 MARKS