

1 Statistical sampling 12 marks

1. (a) Max wants to take a random sample of students from his year group.

(i) Explain what is meant by a random sample.

(ii) Describe a method Max could use to take his random sample.

(b) The table below shows the numbers of students in 5 year groups at a school.

Year	Number of students
9	239
10	257
11	248
12	190
13	206

Lisa takes a stratified sample of 100 students by year group.

Work out the number of students from Year 9 she has in her sample.

(Total for Question is 4 marks)

2. The table shows information about 1065 students.

	Male	Female
Year 7	126	109
Year 8	112	134
Year 9	121	114
Year 10	87	94
Year 11	88	80

Elena takes a stratified sample of 120 students by year group and by gender.

Work out the number of Year 8 female students in her sample

(Total for Question is 2 marks)

3. Nathan is doing a survey about DVDs.

He writes a questionnaire.

Nathan decides to hand out his questionnaire to the women who are inside a DVD store.

His sample is biased.

Give two possible reasons why.

(Total for Question is 2 marks)

4. For a school project, Neville is investigating the types of music people in the UK like to listen to.

He collects data by asking friends from his year group.

Is this sample likely to be representative of the population?

Give one way in which the sample could be improved.

(Total for Question is 2 marks)

5. Sara is investigating the variation in daily maximum gust, t kn, for Camborne in June and July 1987.

She used the large data set to select a sample of size 20 from the June and July data for 1987. Sara selected the first value using a random number from 1 to 4 and then selected every third value after that.

- (a) State the sampling technique Sara used.
- (b) From your knowledge of the large data set, explain why this process may not generate a sample of size 20.

(Total for Question is 2 marks)

Edexcel Large Data Set Activity

This activity is designed to increase your familiarisation with the large data set.

- 1. List the locations on the large data set in order from north to south:
- 2. List the locations that are on the coast:
- 3. a) Look at the daily mean visibility for Camborne May-Oct 1987. Starting with the third value in the column, take a systematic sample by sampling every 15th value.

Sample values:

- b) Use your calculator to find the median and interquartile range for your sample.

Median = _____ IQR = _____

- c) Repeat parts a and b for Leuchars May-Oct 1987:

Sample values:

Median = _____ IQR = _____

- d) Use your answers to compare the mean visibility for Camborne and Leuchars for May-Oct 1987

- 4. Look at the daily mean windspeed for Heathrow May-Oct 1987. You are going to take a simple random sample of size 10.

- a) Start by copying the data in the column onto a new spreadsheet. Add a column next to this containing the numbers 1 to 184 (there are 184 data points). To do this quickly, enter 1 and 2 in the first two cells, highlight them both, then drag down using the small square in the bottom right of the cell.

- b) Explain why more than 10 random numbers may be needed to produce a random sample of size 10.
- c) Use your calculator to generate random integers from 1 to 184 and use these to create a sample of size 10.

On the Classwiz, select RanInt# by pressing Alpha then decimal point, type 1, then comma (shift → close bracket), then 184

On the CG50: select OPTN → F6 (to get more options) → F3 (PROB) → F4 (RAND) → F2 (INT) then press 1, then comma, then 184

Write down the random numbers:

Write down the sample of size 10 corresponding to these random numbers:

5. a) Look at the daily mean air temperature for Beijing in 1987. Take a sample consisting of the first 8 numbers in this column:

Sample: _____

- b) Use your calculator to calculate the mean and standard deviation of your sample, quoting the relevant formulae and showing the method clearly:

- c) Repeat parts a and b for the daily mean air temperature for Perth in 1987:

Sample: _____

- d) Compare the daily mean temperature in Beijing and Perth in 1987:

- e) Give two ways in which the sampling method used in this question could be improved: