

Sampling - Estimating a Population

For Pearson Edexcel GCSE Mathematics (1MA1) • Foundation tier

Name _____

Total marks: **20**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method.

- 1** A juice bar asks a sample of customers which size of smoothie they buy.
The table shows information about the results.

Size	Number of customers
Small	18
Medium	12
Large	10

- (a) What fraction of the customers in the sample buy a large smoothie?
Give your fraction in its simplest form.

.....
(1)

- (b) In the sample, 18 out of 40 customers buy a small smoothie.
Write 18 out of 40 as a percentage.

..... %
(1)

(Total for Question 1 is 2 marks)

- 2** There are 900 students at a school.
Nadia asks a sample of 60 of these students if they are left-handed.
7 of the students in the sample are left-handed.

Work out an estimate for the number of left-handed students at the school.

.....
(2)

(Total for Question 2 is 2 marks)

- 3** Josh and Lisa each want to find out what fraction of the people in their town own a bike.
Josh asks 10 people chosen at random.
Lisa asks 80 people chosen at random.

Whose results will give the better estimate?
You must give a reason for your answer.

.....
(1)

(Total for Question 3 is 1 mark)

- 4** Ruth asks 40 people if they read a book last month. 14 of them say yes.
Dev asks 25 people the same question. 9 of them say yes.

Ruth says,

‘A greater proportion of people said yes in my survey, because 14 is more than 9.’

Is Ruth correct?

You must show how you get your answer.

(2)

(Total for Question 4 is 2 marks)

- 5** A bakery expects to sell 1500 sandwiches at a festival.
It asks a sample of people at the festival which filling they want.
Each person chooses one filling.
The table shows information about the results.

Filling	Number of people
Cheese	21
Egg	12
Chicken	27
Tuna	15

- (a) Work out how many egg sandwiches the bakery should make.

.....
(2)

- (b) State any assumption you made and explain how this may affect your answer.

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

(Total for Question 5 is 3 marks)

- 6** Ann, Bilal and Cal want to find out how many of the 2000 students at their college bring a packed lunch.
Each of them asks some students chosen at random.
The table shows information about their results.

Name	Number of students asked	Number who bring a packed lunch
Ann	20	9
Bilal	50	21
Cal	30	13

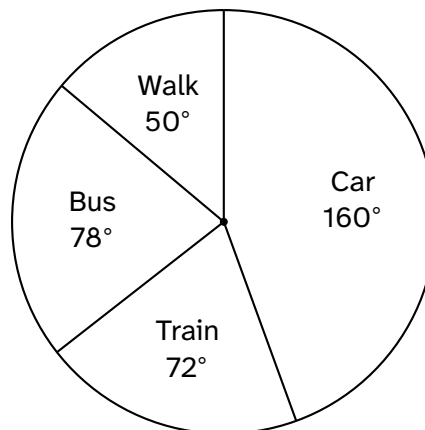
- (a) Whose results will give the best estimate?
Give a reason for your answer.

(1)

- (b) Use all the results in the table to work out an estimate for the number of the 2000 students at the college who bring a packed lunch.

.....
(2)
(Total for Question 6 is 3 marks)

- 7** A sample of the visitors to a museum one month were asked how they travelled to the museum.
The pie chart shows information about their answers.



- (a) There were 4500 visitors to the museum that month.
Work out an estimate for the number of these visitors who came by train.

.....
(2)

- (b) The month before, the museum asked a sample of 50 visitors how they travelled to the museum.
12 of these visitors came by train.
In which month did a greater proportion of the visitors in the sample come by train?
You must show how you get your answer.

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

(Total for Question 7 is 4 marks)

- 8** A bus company has 1400 passengers.
The manager asks a sample of these passengers to rate the service.
The table shows information about the results.

Rating	Number of passengers
Excellent	9
Good	14
OK	15
Poor	12

The manager says,

‘More than 600 of our passengers would rate our service as good or excellent.’

Do the results of the sample support what the manager says?

You must show how you get your answer.

(3)

(Total for Question 8 is 3 marks)
