Higher Numeracy Nov 2018 P1 Q3

Mrs Butler asked all her friends how many pairs of shoes they own.
Here are the results.

Number of pairs of shoes	1 to 6	7 to 12	13 to 18
Number of people	1	5	8

(a) Which is the modal group? [1]

.....

(b) Mrs Butler says,
'Most people in Wales own more than 12 pairs of shoes.'

Is Mrs Butler correct in using this data to come to this general conclusion?
You must give a reason for your answer. [1]

Yes ☐ No ☐

(c) Write down **different groups** Mrs Butler could have chosen so that all of the data can be analysed more accurately. [2]

Higher Numeracy Nov 2017 P1 Q1a

(a) Ysgol Fron Isa and Ysgol Caewen are two very different high schools.
One school is large, and in a rural area. The other is a small school in a town.
The town in which the small school is situated has many traffic-free cycle routes.

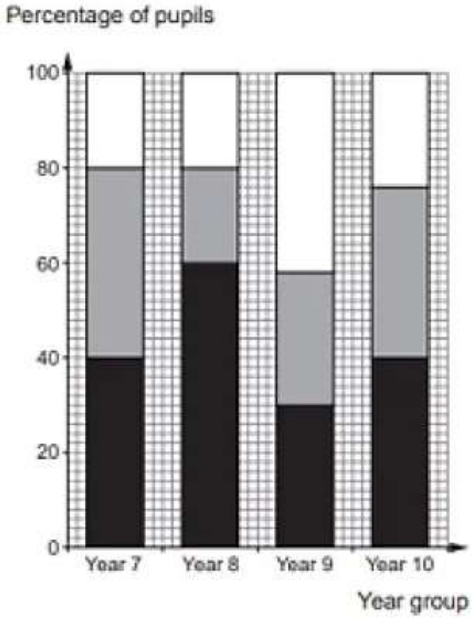
All of the pupils in Years 7 to 10 were surveyed in both of these schools.
They were asked the following questions.

Do you cycle to school?	Yes ☐	No ☐
If you answered 'no', would you like to cycle to school?	Yes ☐	No ☐

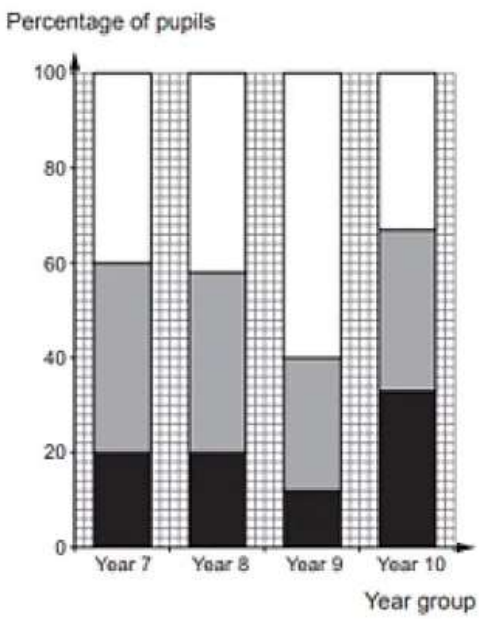
The results were displayed in graphs, as shown below.

Key: ■ Cycle ▒ Would like to cycle ☐ Others

Ysgol Fron Isa



Ysgol Caewen



(i) Which school and year group has an approximately equal split between the 3 categories:
- pupils who cycle to school,
- pupils who would like to cycle to school, and
- other pupils? [1]

School: ..... Year Group: .....

(ii) Circle either TRUE or FALSE for each of the following statements. [3]

There are definitely more pupils in Ysgol Fron Isa who cycle to school than in Ysgol Caewen.	TRUE	FALSE
Both schools have pupils in each year group with no interest in cycling to school.	TRUE	FALSE
The questions asked were biased.	TRUE	FALSE
Approximately 20% of the pupils surveyed in Ysgol Caewen cycle to school.	TRUE	FALSE
It is more likely that it is Ysgol Fron Isa that is the small school situated in a town.	TRUE	FALSE

Higher Numeracy Nov 2016 P2 Q6

Porth Ifan Hospital has made some changes to improve patient care.
A survey is to be used to find out the views of the hospital staff.

(a) The table shows the total number of staff in each job type.

Job type	Doctor	Nurse	Management	Clerical
Number of staff	120	320	56	144

The survey is to be given to a sample of 75 staff.

Use a stratified sampling method to calculate the number of staff from each job type that should be asked to complete the survey.
You must show your working. [4]

Job type	Doctor	Nurse	Management	Clerical
Number in sample				

(b) The hospital decides to take a random sample of its 120 doctors to select those needed for the survey.
Use the following list of random numbers to select the first **5 doctors**.
You must start with the first number in the list, explaining clearly how you are using the numbers to select the sample. [3]

032	520	021	924	152	627	351	295	081	495
542	708	339	557	396	949	417	235	962	261
837	783	983	493	876	924	032	421	205	740
055	491	806	415	158	392	441	521	105	342
782	398	923	729	968	244	119	480	451	780

Higher Numeracy Nov 2018 P1 Q7a

(a) There is a queue of 96 people waiting to buy concert tickets.

Liam has 8 vouchers to hand out, offering 20% off ticket prices.

He has decided to use a systematic sampling method to select who receives these 8 vouchers.

Liam has randomly selected the 6th person in the queue to receive the first voucher.

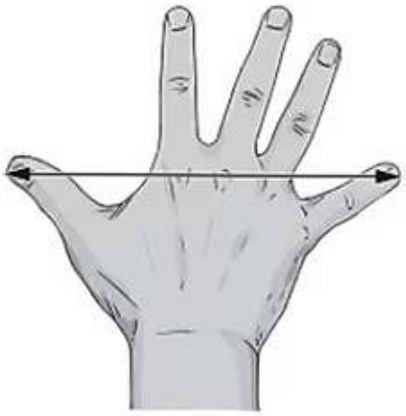
Use the table below to give the positions in the queue of the 8 people who would receive vouchers. [2]

Voucher	1	2	3	4	5	6	7	8
Position in the queue	6th	.....	.....	.....	.....	.....	.....	.....

Higher Numeracy Summer 2017 P2 Q7a

Simon plans to make gloves.

(a) One morning, Simon decided to carry out a survey to find the mean hand span of people in Wales.



He decided to sample systematically.
He decided to sample from the first 240 people who pass him in the street during the morning.

He wanted to take 20 people's hand span measurements.
Explain how Simon could use systematic sampling to obtain 20 measurements. [1]

Numeracy Higher Nov 2016 P1 Q9

Circle TRUE or FALSE for each of the following statements. [2]

Selecting the first name on each class register will give a random sample.	TRUE	FALSE
The ratio of boys to girls in a school is 2 : 3. The pupil committee of 30 pupils is selected using a gender stratified sample. There are 10 boys and 20 girls on the school committee.	TRUE	FALSE
A telephone survey is carried out to find which political party people support. The sample of people surveyed is **not** a random sample of the whole population.	TRUE	FALSE
A stratified sample always considers proportions according to given criteria.	TRUE	FALSE
A random sample of people means everyone has an equal chance of being selected.	TRUE	FALSE

Numeracy Higher Nov 2017 P2 Q9b

(b) 50 engineers are employed by the company.
Use the following extract from a table of random digits to choose 9 engineers for the sample.
You must start with the first number in the list.
Describe clearly how you are using the numbers to select the sample. [3]

29974 55479 07248 33999 17038 02475 49979 01218

Numeracy Higher Nov 2017 P2 Q9a

. An engineering company employs 85 staff.
The company plans to carry out a survey on staff health.
It will conduct the survey using a sample of 15 of its staff, stratified by job type.

(a) Circle either TRUE or FALSE for each statement given below. [2]

STATEMENT		
Choosing every 4th person on an alphabetical list of office staff is a suitable method of randomly choosing the office staff required for the sample.	TRUE	FALSE
Numbering the cleaning staff, placing the numbers in a hat and drawing out numbers at random is a suitable method of choosing the cleaners required for the sample.	TRUE	FALSE
There are 9 managers employed by the company. The calculation to find the number of managers in the sample is $\frac{9}{85} \times 15 = 1{\cdot}59$. This answer means there will **definitely** be 2 managers in the sample.	TRUE	FALSE
The proportion of the staff in each job type in the sample will be **exactly** the same as the proportion of the staff in each job type in the company as a whole.	TRUE	FALSE

Higher Numeracy Summer 2017 P2 Q9

9. The table shows the number of Year 11 pupils attending schools in Cwmifan.

School	Cwrt Haf	Cwmifan High	Henclwyd
Number of Year 11 pupils	307	239	144

In total there are 690 Year 11 pupils attending these three schools.

A new youth theatre has been set up in Cwmifan.
On the opening night, a total of 80 Year 11 pupils from these three schools are going to be invited to attend.

Use a stratified sampling method to calculate the number of Year 11 pupils from each school who should be invited.
You must show all your working. [3]

.....

School	Cwrt Haf	Cwmifan High	Henclwyd
Number that should be invited			

Higher Numeracy Nov 2018 P1 Q10

Each of the 250 Year 10 pupils in Blaengwyn school study one foreign language at GCSE.
The table below shows how many pupils chose to study French, German and Spanish.

French	German	Spanish
75	55	120

The Languages department is planning to take a group of 30 pupils on an educational trip to Europe.

Use a stratified sampling method to calculate the number of Year 10 pupils from each language group that should be taken on the trip.
You must show all your working. [4]

Higher Numeracy Sam 1 P2 Q10

(a) A School Council wants to know pupils' views on their school uniform.
Which of the following statements shows how a truly random sample of the general population can be obtained? [1]
Circle your answer.

A: Randomly selecting pupils in the canteen at lunchtime.

B: Randomly selecting pupils from those that attend the next School Council meeting.

C: Randomly selecting pupils with a surname beginning with the letter J.

D: Giving each pupil a raffle ticket and then randomly drawing raffle tickets for selection.

E: Selecting every 2nd pupil from each form register.

(b) *VotePredict* is a specialist company working in the field of polling and predicting voting patterns in elections worldwide.
They are asked to organise a debate with an audience that is representative of five political parties.
The five political parties and their predicted number of votes, given in alphabetical order, are as follows.

Political Party	Predicted votes
Central	23 456
Economy	43 244
First Reformists	83 124
Status Quest	11 782
West Term	63 789

The invited audience should be a stratified sample using this information.

It is intended to have 250 people in the audience at the debate.
How many people who intend to vote for the Central Party should be in the audience? [3]

Higher Maths Sample 2 P2 Q11

11. The table below shows the number of people employed by a graphic design company.

	Male	Female
Full-time	125	30
Part-time	18	87

The company plans to take a stratified sample of 40 members of staff, to find out their views on how the company could be improved.
Calculate the number of staff from each of the four categories that should be in the sample.
[3]

Higher Numeracy Sample 2 P1 Q11

(a) At the National Eisteddfod in August each year, a concert is performed on the opening night.

Of those performing this year:
- 39 are primary school children,
- 73 are secondary school children,
- 128 are adults.

In order to gather opinions from the performers about the backstage facilities, the organisers decide to question a stratified sample of 40 people.

Find how many secondary school children should be selected.
You must show all your working.

[3]

(b) Rhodri calculates that 7 primary school children should be selected.
Rhodri selects the first 7 primary school children to get off the bus that brings them to the concert.

Explain why this does not represent a random sample of the primary school children.

[1]

(c) Of the 128 adult performers, 52 are male and 76 are female.
Gwen decides to interview a stratified sample of **16 adults** and has exactly 16 copies of the questionnaire ready for them.

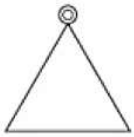
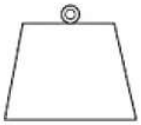
Using these numbers, she calculates that she should interview 7 male performers and 10 female performers, making a total of **17 adults**.

Explain how this has happened.

[2]

Higher Numeracy Summer 2019 P1 Q11b

(b) Alun makes pendants that are mathematical shapes.
The following table shows the pendants and the number of these pendants that Alun made last month.

	Triangle	Circle	Rectangle	Trapezium
Pendant				
Number made last month	52	96	30	62

At the end of last month, Alun took a stratified sample of 30 of these 240 pendants to check their quality.

Calculate how many pendants of each shape were in Alun's sample.
You must show all your working. [4]

Pendant	Triangle	Circle	Rectangle	Trapezium
Number in sample				