

6.1 Some Statistical Words

Qualitative Data

: Data described in words

For example: Colour of eyes, favourite sport

Quantitative Data

: Data described in numbers

For example: Heights in cm of students

Discrete Data

: Data which does not need rounding because it changes in steps

For example: Rolls of dice

Continuous Data

: Data which can take any value within an interval and which has to be rounded

For example: Weights of boys to the nearest 100 grams

6.2 Exercise

Question 1

Consider the following words used to describe eight items of data;

Gigantic	Colossal	Very Large	Enormous
Super-Sized	Massive	Huge	Titanic

Is this data Qualitative or Quantitative ?

Question 2

I have a list of the prices for which 100 houses were sold last month.

Is this data Discrete or Continuous ?

Question 3

I am interested in the the water consumption of 50 households in July.

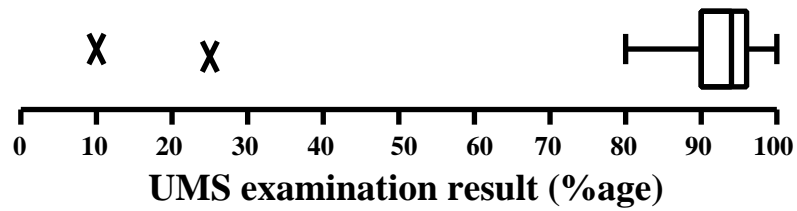
The water meters of the 50 households measure water consumption to the nearest litre.

(i) Am I dealing with Qualitative or Quantitative data ?

(ii) Is the data produced by the water meters Discrete or Continuous ?

Question 4

The box and whisker diagram shows the Statistics examination results of the 200 students at St Trinian's School last year.



- (i) What is the lowest mark obtained by a student in the examination ?
[1 mark]
- (ii) What is the lower quartile mark obtained by the students ?
[1 mark]
- (iii) How many students scored 80% or more ?
[1 mark]
- (iv) Describe the skew of the marks **giving a reason for your answer.**
[2 marks]
- (v) In a press release The Ministry of Education has announced;
“St Trinian's is to close as pupils have scored less than 30% in exams”.
Do you agree with the Ministry ?
Give a reason for your answer.
[2 marks]

Question 5

S1 Examination Question from January 2011 Q2

Keith records the amount of rainfall, in mm, at his school, each day for a week. The results are given below;

2.8 5.6 2.3 9.4 0.0 0.5 1.8

Jenny then records the amount of rainfall, x mm, at the school each day for the following 21 days. the results for the 21 days are summarised below;

$$\Sigma x = 84.6$$

- (a) Calculate the mean amount of rainfall during the whole 28 days.

[2 marks]

Keith realises that he has transposed two of his figures.

The number 9.4 should have been 4.9 and the number 0.5 should have been 5.0

Keith corrects these figures.

- (b) State, giving your reason, the effect this will have on the mean.

[2 marks]

Question 6

Give an example of data that is;

- (a) both DISCRETE and QUALITATIVE

[2 marks]

- (b) both CONTINUOUS and QUANTITATIVE

[2 marks]

Question 7

SI Examination Question from January 2010 Q3

The birth weights, in kg, of 1500 babies are summarised in the table below.

Weight (kg)	Midpoint x kg	Frequency f
0.0 - 1.0	0.50	1
1.0 - 2.0	1.50	6
2.0 - 2.5	2.25	60
2.5 - 3.0		280
3.0 - 3.5	3.25	820
3.5 - 4.0	3.75	320
4.0 - 5.0	4.50	10
5.0 - 6.0		3

[You may use $\Sigma fx = 4841$ and $\Sigma fx^2 = 15\,889.5$]

(a) Write down the missing midpoints in the table above.

[2 marks]

(b) Calculate an estimate of the mean birth weight.

[2 marks]

(c) Calculate an estimate of the standard deviation of the birth weight.

[3 marks]

(d) Use interpolation to estimate the median birth weight.

(e) Describe the skewness of the distribution.
Give a reason for your answer.

[2 marks]

[2 marks]

Question 8

S1 Examination Question from January 2011 Q5

On a randomly chosen day, each of the 32 students in a class record the time, t minutes to the nearest minute, they spent on their homework.

The data for the class is summarised in the following table.

Time, t	Number of students
10 - 19	2
20 - 29	4
30 - 39	8
40 - 49	11
50 - 69	5
70 - 79	2

- (a) Use interpolation to estimate the value of the median.

[2 marks]

Given that

$$\Sigma t = 1414 \quad \text{and} \quad \Sigma t^2 = 69\,378$$

- (b) find the mean and the standard deviation of the times spent by the students on their homework.

[3 marks]

- (c) Comment on the skewness of the distribution of the times spent by the students on their homework.
Give a reason for your answer.

[2 marks]

Question 9

SI Examination Question from May 2009 Q4

A researcher measures the foot lengths of a random sample of 120 ten-year-old children. the lengths are summarised in the table below;

Foot length, l , (cm)	Number of children
$10 \leq l < 12$	5
$12 \leq l < 17$	53
$17 \leq l < 19$	29
$19 \leq l < 21$	15
$21 \leq l < 23$	11
$23 \leq l < 25$	7

- (a) Use interpolation to estimate the median of this distribution.

[2 marks]

- (b) Calculate estimates for the mean and the standard deviation of these data.

[6 marks]

One measure of skewness is given by

$$\text{Coefficient of skewness} = \frac{3 (\text{mean} - \text{median})}{\text{standard deviation}}$$

- (c) Evaluate this coefficient and comment on the skewness of these data

[3 marks]

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Teachers may obtain detailed worked solutions to the exercises by email from mhh@shrewsbury.org.uk