Lesson 7

GCSE Mathematics

Statistics II : Handelling and Processing Data

7.1 Is the data discrete or continuous ?

Some data, such as age, is discrete. (from a legal point of view),

For example, you are 17 until the day of your 18th birthday.
When you are "17 and a half", you cannot argue that this rounds up to 18 and therefore you are allowed into a pub to drink and to buy cigarettes from a shop.

One day the law says you are 17. The next, your 18th birthday, you are 18.
There is no "in between" from the Law's point of view.
NOT always having an "in between" indicates that the data is DISCRETE.

Some data, such as a height or weight, always has an 'in between'.
In between 14 kg and 15 kg is, for example, 14.5 kg.
In between 14.6 kg and 14.7 kg is, for example, 14.65 kg.
ALWAYS having an "in between" indicates that the data is CONTINUOUS.

7.2 Grouped Frequency tables

Continuous data is often presented in a grouped frequency table.

7.2.1 Example

GCSE examination question from 7th November 2005, paper 4H

The table gives information about the heights of some plants.

Height, h cm	Frequency		
$0 < h \leqslant 5$	4		
$5 < h \leqslant 10$	6		
$10 < h \leqslant 15$	8		
$15 < h \leqslant 20$	2		

Calculate an estimate of the mean height.

7.3 Exercise

Question 1

Fifty boxes of peaches were examined and the number of bad peaches in each box recorded, with the following result;

Number of bad peaches	Frequency		
$0 \leqslant bp \leqslant 4$	34		
$5 \leqslant bp \leqslant 9$	11		
$10 \leqslant bp \leqslant 14$	4		
$15 \leqslant bp \leqslant 19$	1		

Estimate the mean number of bad peaches per box.

Question 2

In a draft copy of a 140 page story, the nomber of typin mistaks on each paige was recordad, with the followring result;

Number of typing mistakes	Frequency		
$0 \leqslant m \leqslant 2$	72		
$3 \leqslant m \leqslant 5$	58		
$6 \leqslant m \leqslant 8$	7		
$9 \leqslant m \leqslant 11$	3		

Estimate the mean number of typing mistakes per page.

Question 3

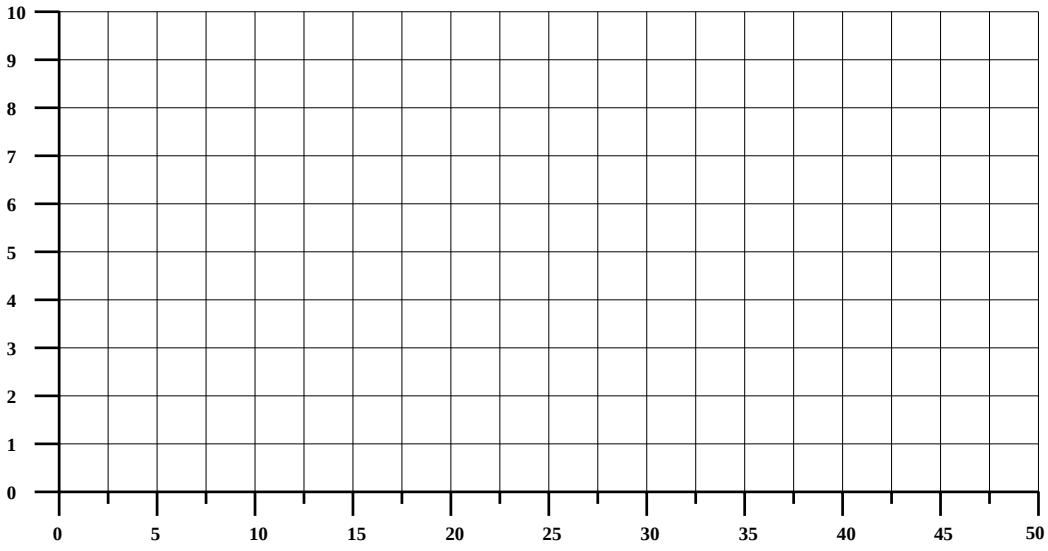
Twenty-four 14 year old pupils are asked to record how many hours they spend on a computer over a one week period. Here are the results;

28.5	26.25	24.0	18.25	28.75	36.0	12.75	27.5
23.75	16.0	19.5	26.25	32.25	28.5	29.75	34.0
15.25	24.25	27.25	18.5	8.5	34.5	32.0	22.5

(a) Transfer this data into the following grouped frequency table.

Number of hours	Tally	Frequency		
$5 \leqslant h < 10$				
$10 \leqslant h < 15$				
$15 \leqslant h < 20$				
$20 \leqslant h < 25$				
$25 \leqslant h < 30$				
$30 \leqslant h < 35$				
$35 \leqslant h < 40$				

(b) Plot a frequency polygon using the data in the table.
Label the axes, and add a title.



Question 4

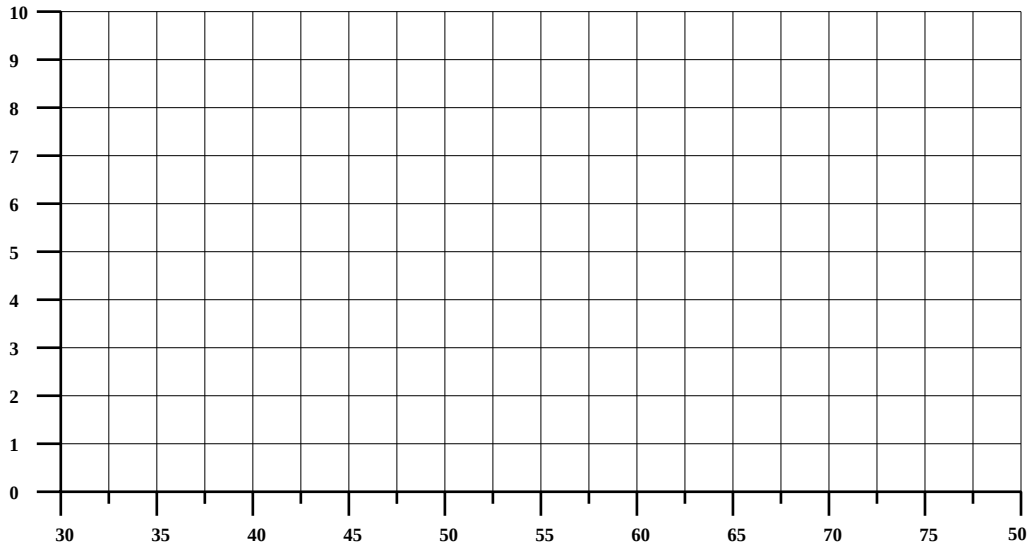
Here are the English test marks of 31 pupils

57	72	63	58	57	34	37	**45**	38
42	51	48	**35**	64	**55**	63	61	46
54	**50**	56	63	61	37	47	74	67
58	54	36	**65**					

(a) Fill in the following table using the English marks data.
Take care over where you place the underlined data.

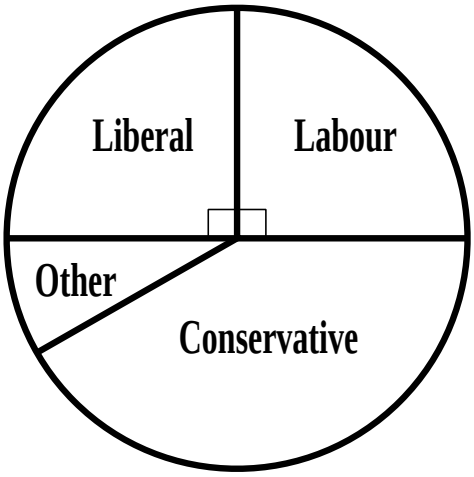
Mark	Tally	Frequency		
$30 < m \leqslant 35$				
$35 < m \leqslant 40$				
$40 < m \leqslant 45$				
$45 < m \leqslant 50$				
$50 < m \leqslant 55$				
$55 < m \leqslant 60$				
$60 < m \leqslant 65$				
$65 < m \leqslant 70$				
$70 < m \leqslant 75$				

(b) Use the grouped frequency table to plot a frequency polygon to show the distribution of the marks from the English exam.
Label the axes, and add a title.



Question 5

One hundred and eighty people are asked how they intend to vote at the next election.
The responses are presented in the pie chart, shown below.



(a) How many people said they would vote Labour ?

(b) What ***percentage*** of people said they would vote Liberal ?

(c) If seventy-two people said they would vote Conservative, how many said they would vote for "Other" ?

Question 6

Mr Minted invites private bids for the smallest of his many yachts.
At the close of bidding the bids are revealed to be:

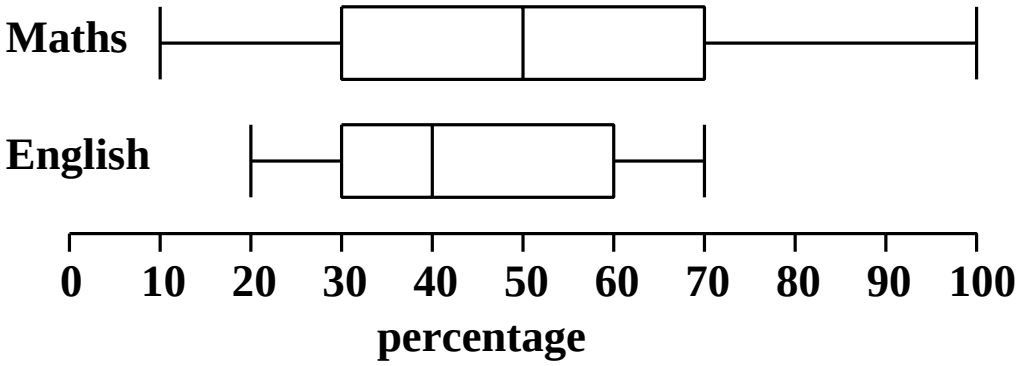
£8 000	£12 990	£2 000
£10 000	£2010	£7000

(a) What is the mean amount of money bid ?

(b) What is the median amount of money bid ?

Question 7

Here are two Box-and-Whisker diagrams which show the marks obtained by a class of pupils in a Maths and in an English test.



(a) Is the median mark higher in Maths or English ?

(b) What is the Inter Quartile Range of the

(i) Maths marks ?

(ii) English marks ?

(c) What do your part **(b)** answers tell you about the two tests ?

Question 8

Buckie Thistle are a Scottish football club near to the city of Aberdeen.
The number of goals per match scored by Buckie Thistle in the Highland league last season are listed below.

1	3	1	1	2	1	3	5	0
0	1	6	2	0	1	2	0	1
2	1	3	2	4	6	3	5	2
5	2	3	3	1	0	1	2	4
4	1	4	2	1	2	0	6	5

(i) Complete the following frequency table.

Number of goals scored per match	Tally	Frequency
0		
1		
2		
3		
4		
5		
6		

(ii) Explaining your reasoning, determine the **median** number of goals scored per match.

Reasoning _____

_____

_____

Answer _____