

Statistics Need to Know

Statistics 1

Mean - average

The mean is the same as the average. The symbol used is \bar{x} .

To find the mean of a group of numbers.

$$\text{Mean} = \frac{\text{Add up the numbers}}{\text{Number of numbers}}$$

To find a missing number when given mean.

This time we are given the answer and must work backwards.

To construct a frequency table and then find the mean.

The next thing we move to is what is called a frequency table. This is a way of presenting information in a clear and quick way.

Method 1 Use the heading x f fx and then the formula.

$$\text{Mean} = \frac{\sum fx}{\sum f}$$

With the headings there are 3 lines.

Line 1 Under the x write the top line of the frequency vertically down.

Line 2 Under the f write the bottom line of the frequency vertically down.

Line 3 Under the fx multiply line 1 by line 2.

Note $\sum f$ mean add up line 2.

$\sum fx$ mean add up line 3.

Method 2

$$\text{Mean} = \frac{\text{Top by Bottom added}}{\text{Bottom added}}$$

Construct a frequency table for the following information, which shows the number of goals scored on the first day of the season.

1 2 2 3 5 2
2 3 4 1 4 2

To form a frequency table simply count the number of 1s, 2s and so on.

Goals	1	2	3	4	5
Games	2	5	2	2	1

Statistics 2

Mean - average

To find the mean of a grouped frequency distribution table.

A grouped frequency distribution table is where we group the information in wider bands. For example we may talk about the number of children on a street which are 0 - 2 years old.

To find the mean we use the exact same method as a frequency table but use the mid - interval of the group.

What is meant by mid - interval? What is the mid interval of 0 and 2? The answer is the number in the middle of 0 and 2 so mid - interval 1.

Mid - interval of 2 – 4 is 3 and of 4 – 6 is 5 and of 6 – 8 is 7.

To find a missing frequency when given mean.

Same type of question as the last one but this time we start with different information. Stick to the method.

Worded questions

These are questions in which we are told the number of numbers and their mean and what we have to do is find the sum of the numbers by using the idea that

$$\text{Mean} = \frac{\text{sum of numbers}}{\text{number of numbers}} \text{ and changing it around to}$$

$$\text{Sum of numbers} = \text{mean} \times \text{number of numbers}$$

Statistics 3

To find the mode and median

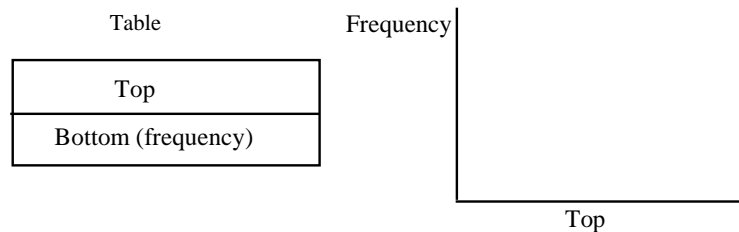
Mode This is defined as the result that occurs most often, i. e. it is the result with the highest frequency. For a grouped frequency table it is called the modal class or modal group.

Median The middle value i.e. half way. To find the median write the numbers in order of size and go half way.

To draw a Histogram

When dealing with the diagrams that follow always remember that the frequency is on the vertical axis of the diagram.

An easy way to remember this is that the figures on the top go down the bottom of the diagram and the figures on the bottom go up the side.



Area of each rectangle represents the frequency.

At a sports meeting, the distance for competitors each throwing a javelin are

Distance	0 - 20	20 - 50	50 - 60	60 - 80	80 - 120
No. of Competitors	8	21	8	10	24

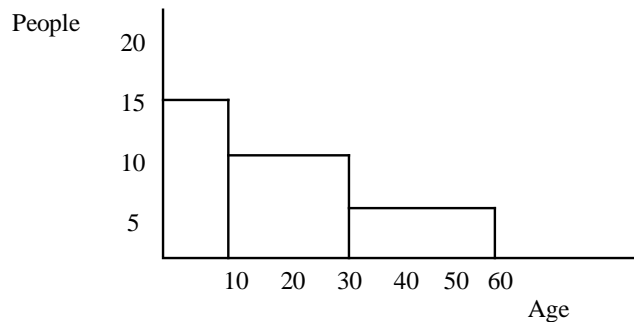
Show this information in a histogram.

First do out a new table for yourself using the following

- (i) Write all the gaps on top of the frequency table.
- (ii) Find the smallest gap 50 – 60 and let this represent a unit of 1.
- (iii) Adjust all other gaps accordingly i.e.
 - 0 – 20 = gap of 20 = 2 units,
 - 20 – 50 = gap of 30 = 3 units,
 - 60 – 80 = gap of 20 = 2 units,
 - 80 – 120 = gap of 40 = 4 units these we call our base.
- (iv) Divide each frequency by new base to find actual height up.

To find the frequency of a grouped frequency table when given the histogram

The histogram shows the ages of a group of people. What was the modal class?



Statistics 4

To Draw a Cumulative Frequency Curve (Ogive)

Draw a cumulative graph (ogive) to represent the following information, which shows the marks obtained by 100 students in a maths exam.

Marks	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70
Students	10	2	5	10	41	28	4

Use the graph to find

- (a) The median mark
- (b) The interquartile range.
- (c) The number of students that obtained over 65 marks.

We must first draw a cumulative frequency table. Remember to ADD.

Marks	<10	<20	<30	<40	<50	<60	<70
Students	10	12	17	27	68	96	100

- (a) Median – This is half of the total frequency. We always start half way up the vertical axis at the 50th student, draw a line straight across until it hits the curve and then come to find the answer.
- (b) Interquartile range - this is between the first quarter and the third quarter of the total frequency.
Start at 25 and 75 on the vertical axis come across to hit the graph and then come straight down for the interquartile range.
- (c) There are a huge number of questions here. Care must be taken to decide from which axis to start from. This very much depends on the information given in the question so read it carefully.

In this question we were given the marks and asked to find the number of students . Start on the horizontal axis, go up to hit the graph and across for the answer.

Since it says “over 65 marks” we take the answer away from 100.

Note With any of the answers above we are allowed to an error of ± 3 .

From the cumulative frequency fill in the frequency distribution table.

Age	<2	<4	<6	<8	<10
No. of people	3	7	15	19	20

Age	0 - 2	2 - 4	4 - 6	6 - 8	8 - 10
No. of people					

To fill in the frequency table just SUBTRACT.

Age	0 - 2	2 - 4	4 - 6	6 - 8	8 - 10
No. of people	3	4	8	4	1

Pie Charts

If we are asked to draw a pie chart we must

- (a) find the total number of games (add up the bottom)
- (b) find the angle for each game by using

$$\text{Angle} = \frac{\text{no. of games}}{\text{total}} \times \frac{360}{1}$$

Given the pie chart.

$$\text{Number required} = \frac{\text{Angle}}{360} \times \frac{\text{Total}}{1}$$