

fs4u

Mean, Median & Mode

‘How To’ Booklet 31

Mean, Median & Mode

A class of 20 pupils obtained the following marks out of 50 in a test

29	25	23	21	18
12	3	34	48	37
38	42	46	24	5
25	32	16	36	27

For this set of data the MEAN, MEDIAN and MODE can be found.

MEAN (i.e. The Arithmetic Mean)

A mean can be found in two ways:-

- a) Add up all the individual pieces of data and divide by the number of pieces of data (20 in this case).

$$\text{MEAN} = (29+12+38+25+25+3+42+32+23+34+46+16+16+21+48+24+36+18+37+5+27) \\ \text{divided by } 20$$

$$= \frac{541}{20}$$

Mean = **27.05**

- b) Using the frequency table (this method only gives an approximate mean)

Marks	Mid point (m)	Frequency (f)	m x f
0-10	5	2	10
11 – 20	15	3	45
21 – 30	25	7	175
31 – 40	35	5	175
41 – 50	45	3	135
Total		20	540

$$\text{Mean} = \frac{(\text{m} \times \text{f}) \text{ total}}{\text{f total}} = \frac{540}{20}$$

Mean = **27**

MEDIAN

The median can be represented in two ways.

- a) all data can be put in ascending order, the median is the middle one.

3, 5, 12, 16, 18, 21, 23, 24, 25, **25, 27**, 29, 32, 34, 36, 37, 38, 42, 46, 48

Mean, Median & Mode (31)

As we have an even number of pieces of data (20 in this case) there are two middle numbers, the 10th and the 11th, so the median is the average of these:-

$$\text{Median} = \frac{25 + 27}{2} = 26$$

If there is an odd number of items of data, then after putting them in order simply pick the middle item.

3, 5, **12**, 15, 16 Median = **12**

- b) The median can also be obtained from a cumulative frequency curve. This is covered in a later section (Workbook 32)

Mode

The mode is the piece of data or interval which occurs most frequently, in this case it is 25.

Mode = **25** (it occurs twice)

Modal interval = **21 – 30**

(This is the highest bar in the bar chart – there are 7 of these)

These calculations can be done with data collected from within your vocational area. Your data can also be inputted into a computer database and the results, including frequency tables, bar charts and pie charts, can be obtained.

Activity

Thirty people were surveyed in a shopping centre and asked their ages. These are displayed below.

54	41	65	46	66	37
32	71	34	73	15	26
64	22	54	8	58	43
14	57	43	52	24	68
43	39	59	35	48	49

a	find the mean
b	find the median – by putting all the data in ascending order
c	find the modal interval – using 0-10, 11-20, 21 – 30, 31 – 40, 41 – 50, 51 – 60, 61 – 70, 71 – 80