



Junior Cert Maths

Free Notes

Averages



Averages

The mode is the value that occurs most often.

The mode of 20,22,25,26,28,22,25,22,28,20,26,22 is 22 as it occurs the most amount of times in the sequence.

The median is the middle value when the values are arranged in order of size.

To get the median of 14,21,17,11,19,15,16 we must first rearrange our values in ascending order

11,14,15,16,17,19,21

Our middle value of the sequence is 16 so this is our median

If we are getting the median of an even number of values we must get the average of our middle two values

To get the median of 34, 36, 30, 28, 42, 38, 33, 35 we first arrange in ascending order
28, 30, 33, 34, 35, 36, 38, 42

Our middle values are 34 and 35 so our median is $\frac{34+35}{2} = 34.5$

The mean of a set of values is the sum of all the values divided by the number of values.

$$\text{Mean} = \frac{\text{Sum of all the values}}{\text{Number of values}}$$

To get the mean of 30, 28, 34, 37, 22 we add up all our values and divide by the number of values which in this case is 5

$$\text{Mean} = \frac{30+28+34+37+22}{5} = 30.2$$

The range or spread of a set of values is the difference between the highest value and the lowest value

The mean, mode and median are sometimes called the measures of central tendency

Questions

1. The mean of 5 numbers is 12 find the sum of the numbers

$$\text{Mean} = \frac{\text{Sum of all the values}}{\text{Number of values}}$$

Mean \times Number of values = Sum of all the values

$$5 \times 12 = 60$$

2. In 4 games, a soccer player scored 1, x, 4 and 3 goals respectively. The mean number of goals scored by the player per game was 2.

Find the number of goals scored in the second game i.e. the value of x.

$$\text{Mean} = \frac{\text{Sum of all the values}}{\text{Number of values}}$$

$$\frac{1+x+4+3}{4} = 2$$

$$8 + x = (4)(2)$$

$$8 + x = 8$$

$$x = 0$$

3. Given the numbers 42,44,39,52,37,44,49,42,44,40 Find the mode, median and mean.

Mode = 44 as it occurs most frequently

Arrange in ascending order to find median 37, 39, 40, 42, 42, 44, 44, 44, 49, 52

Get the average of our two middle values Median = $\frac{42+44}{2} = 43$

Mean = $\frac{42+44+39+52+37+44+49+42+44+40}{10} = 43.3$

4. Three groups of 10 students in a third-year class were investigating how the number of jelly beans in a bag varies for three different brands of jelly beans.

Group 1 (Brand A)

23 25 25 26 26 32 32 33 34 35

Group 2 (Brand B)

17 22 22 24 24 29 29 29 29 29

Group 3 (Brand C)

25 25 25 26 26 29 29 30 30 31

If you were to buy a bag of jelly beans which brand would you buy? Give a reason for your answer based on the data provided above

Group 1 has a mean of $\frac{23+25+25+26+26+32+32+33+34+35}{10} = 29.1$

and a range of $35 - 23 = 12$

Group 2 has a mean of $\frac{17+22+22+24+24+29+29+29+29+29}{10} = 25.4$

and a range of $29 - 17 = 12$

Group 3 has a mean of $\frac{25+25+25+26+26+29+29+30+30+31}{10} = 27.6$

and a range of $31 - 25 = 6$

Group 3 brand has the smallest range which means that it is the most consistent. It is the most likely to be close to its given mean. However Group 1 has the highest mean. Since Group 1 has the highest mean so we choose this Group as on average we will get the most amount of Jelly beans.

5. The table below shows the distances travelled by seven paper airplanes after they were thrown.

Airplane	A	B	C	D	E	F	G
Distance (cm)	188	200	250	30	380	330	302

(i). Find the median of the data

Arrange the values in ascending order

30, 188, 200, 250, 302, 330, 380

Our median is 250 as it is our middle value

(ii) Find the Mean of the data

$$\frac{188+200+250+30+380+330+302}{7} = 240$$

(iii) Airplane D is thrown again and the distance it travels is measured and recorded in place of the original measurement. The median of the data remains unchanged and the mean is now equal to the median. How far did airplane D travel the second time?

Mean = 250

$$\frac{188+200+250+x+380+330+302}{7} = 250$$

$$\frac{1650+x}{7} = 250$$

$$1650 + x = 7(250)$$

$$1650 + x = 1750$$

$$x = 1750 - 1650 = 100$$

Airplane D travelled 100cm

(iv) What is the minimum distance that airplane D would need to have travelled in order for the median to have changed?

For the median to change Airplane D would have to travel greater than 250cm

So our answer is 251cm

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