Topic: Measures of Central Tendency

Introduction:

In everyday language most people have an inherent understanding of what the term average means. However, within the language of mathematics there are three different definitions of average known as the **mean**, **median** and **mode**. These averages are also called '**measures of central tendency**". Averages are useful because they summarise a large amount of data into a single value.

Refresher Video:

https://youtu.be/5C9LBF3b65s

Summary:

Measures of central tendency are calculated as below:

Mean (Average): Found by **adding** up all of the given data and **dividing** by the number of data entries.

Median*:* The **middle** number in an **ordered** list

Mode: The most **frequent** number in the list.

Example a:

Q: Work out the mean for this set of data: 7, 9, 11, 6, 13, 6, 6, 3, 11

A: To work out the mean:

- Add up all the numbers. 7 + 9 + 11 + 6 + 13 + 6 + 6 + 3 + 11 = 72
- Divide the answer by how many numbers there are. There are 9 numbers. 72 ÷ 9 = 8
  So the **mean** value is **8**.

Example b:

Q: Calculate the median for this set of data: 7, 9, 11, 6, 13, 6, 6, 3, 11

A: The median is the **middle** value. To work out the median:

- Put the numbers in order: 3, 6, 6, 6, 7, 9, 11, 11, 13
- The number in the middle of the list is the median. So the **median** value is **7**.

Example c:

Q: Calculate the median for this set of data: 3 6 6 6 7 8 9 11 11 13

A: The numbers are already in order. If there are two middle values, the median is **the sum of the two middle values divided by 2.**

There are two middle values, 7 and 8. The **median** is therefor (7+8) ÷ 2 = **7.5**.

Example d:

Q: Work out the mode for this set of data: 7, 9, 11, 6, 13, 6, 6, 3, 11

A: The mode is the value that appears the most. To work out the mode:

- Put the numbers in order: 3, 6, 6, 6, 7, 9, 11, 11, 13
- Look for the number that appears the most. 6 appears more than any other number. So the **mode** value is **6**.

Questions:

Find the mean, median and mode for these sets of numbers:

a) 3, 12, 10, 9, 3
b) 8, 12, 6, 6, 12, 10, 9, 6, 8, 3
c) 6, 7, 13, 6, 3
d) 11, 9, 8, 8, 14, 4
e) 11, 8, 6, 6, 11, 13, 12, 6, 14, 3

Answers:

a) Mean = 7.4 , median = 9 , mode = 3
b) Mean = 8 , median = 8 , mode = 6
c) Mean = 7 , median = 6 , mode = 6
d) Mean = 9 , median = 8.5 , mode = 8
e) Mean = 9 , median = 9.5 , mode = 6