Averages, Means, Medians and Modes

Average is normally taken to be the 'mean', that is, the sum of a list of numbers, divided by the number of numbers in the list

$$\text{Mean} = \frac{Total\ Sum}{Number\ of\ numbers}$$

If you place the list of numbers in increasing order, the median is the number in the middle. If there are an even number of numbers, and hence two numbers in the 'middle', then the median is the mean (or middle) of those two numbers.

The mode is the number that appears most often in the list.

Example

A survey of the number of occupants in each house on a street produces the following data

1 4 7 2 3 1 2 5
6 4 1 9 3 2 1

(i) What is the mean number of house occupants?

$$\text{Mean} = \frac{Total\ Sum}{Number\ of\ numbers} = \frac{1+4+7+2+3+1+2+5+6+4+1+9+3+2+1}{15} = \frac{51}{15} = 3.4 \text{ occupants}$$

Therefore the mean, or average, number of house occupants on the street is 3.4

(ii) What is the median?

First we rearrange the list into increasing order
1, 1 ,1, 1, 2, 2, 2, 3, 3, 4, 4, 5, 6, 7, 9
And then we find the 'middle' number. The middle number here is 3
Therefore the median is 3.

(iii) What is the mode?

The mode is the number that appears most often. The mode is 1, as four houses have only 1 occupant.

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Example

Twenty people were asked for their number of siblings.

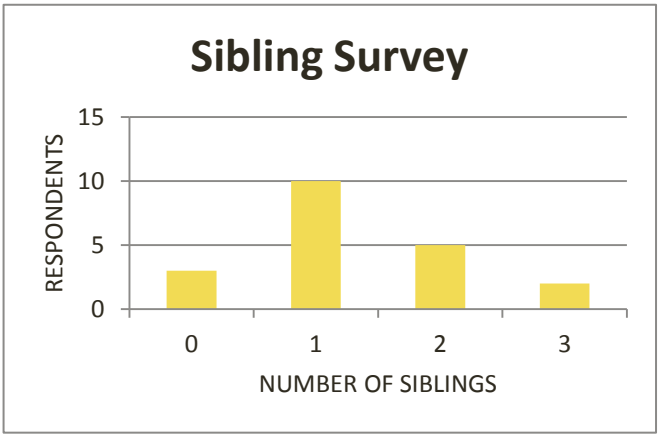
(i) Calculate the mean number of siblings.

Mean = $\frac{Total\ number\ of\ siblings}{Number\ of\ people\ asked}$

$= \frac{(3\ x\ 0)+(10\ x\ 1)+(5\ x2)+(2\ x\ 3)}{20}$

$= \frac{26}{20}$ = 1.3 siblings

Therefore the average number of siblings is 1.3



(ii) What is the mode?

The mode is the number of siblings that is most common. It is most common to have 1 sibling (as 10 of the survey respondents reported this value). (Also, we note that the mode is the tallest bar).

(iii) What is the median?

The median is the middle value. There are twenty respondents all together, so we know that the 'middle' value is the mean of the 10th and 11th values.

From looking at the bar chart, it is clear that the 10th value is 1, and that the 11th value is also 1. Therefore the mean of these values is 1.

Therefore, the median is 1.

> *Note*
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> *If you haven't studied statistics formally, these questions may seem particularly difficult to you. However, the level of questions asked in numerical reasoning tests should be within everyone's general understanding – so just try and have a go.*
>
> *Remember, a lot of it is just common sense!*

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