Measures of Centre

Understanding Measures of Centre

Measures of centre describe the “middle” or “average” of a data set.

There are **3 types**:

Measure	Meaning	Best used when
Mean	The average value	Data has no major outliers
Median	The middle value	Data has outliers or a widespread
Mode	The most common value	Categorical data or most frequent result

1. Mean

The **mean** is the total of all values divided by how many values there are.

Formula

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

Steps	Example
1. Add all values together	Data: 1, 3, 4, 6, 6, 7 1+3+4+6+6+7 = 27
2. Divide by the number of values	$= \frac{27}{6}$
Mean	= **4.5**

2. Median

The **median** is the middle value when the data is arranged in order.

Steps	Example
1. Put the data in order	7, 6, 1, 4, 6, 3 ↓ 1, 3, 4, 6, 6, 7
2. Find the middle number	1, 3, 4, 6, 6, 7
3. If there are 2 middle numbers, add them together and divide by 2	$= \frac{4+6}{2}$
Median	= **5**

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3. Mode

The **mode** is the value that appears the most.

Steps	Example
1. Put the data in order	7, 6, 1, 4, 6, 3 ↓ 1, 3, 4, 6, 6, 7
2. Find the number that occurs most often Mode	1, 3, 4, **6**, **6**, 7 = **6**

Outliers

An outlier is a value that is much larger or smaller than the rest of the data.

Outliers can affect averages.

Measure	Effect of outliers
Mean	Strongly affected
Median	Usually not affected much
Mode	Usually unaffected

Example

Data: 5, 7, 7, 8, 12, **33**

With the outlier	Without the outlier
$= \frac{5+7+7+8+12+33}{6}$ Mean = 12 5, 7, 7, 8, 12, **33** $\frac{7+8}{2} = 7.5$ Median = 7.5 5, 7, 7, 8, 12, **33** Mode = 7	$= \frac{5+7+7+8+12}{5}$ Mean = 7.8 5, 7, **7**, 8, 12 Median = 7.5 5, 7, 7, 8, 12 Mode = 7

Related Helpsheets

- Measures of Spread
- Standard Deviation

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