

Averages, frequency tables and range

Topic cliff notes / objectives, key ideas and examples

Learning objectives

- Calculate mean, median, mode and range.
- Find a mean from a frequency table.

Key ideas

- The mean uses every value, including repetitions.

$$\text{mean} = \frac{\text{sum of values}}{\text{number of values}}$$

- Order values for the median. For an even count, average the two middle values.
- The mode is the most frequent value. There may be several modes or no unique mode.
- Range measures the spread between the extremes.

$$\text{range} = \text{maximum} - \text{minimum}$$

- For a frequency table, multiply each value by its frequency before adding.

$$\text{mean} = \frac{\sum xf}{\sum f}$$

Worked example

Books read are zero, one and two, with respective frequencies two, three and five. Find the mean.

$$\sum xf = 0(2) + 1(3) + 2(5) = 13$$

$$\sum f = 2 + 3 + 5 = 10$$

$$\text{mean} = \frac{13}{10} = 1.3 \text{ books}$$

Answer

1.3 books

Quick example

Find the median of the six given values. Order the values.

$$9, 2, 6, 3, 8, 4 \longrightarrow 2, 3, 4, 6, 8, 9$$

$$\text{median} = \frac{4 + 6}{2} = 5$$

Answer

5

Watch out

A frequency counts repetitions. Do not divide a frequency-table total by the number of distinct values.

