

12 Measures of Central Tendency

Name: Class: Date:

12.1 MEAN

Key Skills Checklist	Confidence Level					Related Questions
	1	2	3	4	5	
Find the mean of a set of data						1, 2, 6
Find the mean of grouped data with class intervals						3, 7
Solve problems involving grouped data with individual values						3, 5, 14, 16
Solve problems involving mean of data						4, 8, 9, 10, 11, 12, 13, 15, 17

WORD TOOLBOX

mean

Mean, median and mode are the three **measures of central tendency**. They are also known as **averages** in statistics.

median

The mean of a set of data is derived by the formula:

mode

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

measures of central tendency

For example, the list shows the heights (in cm) of five boys.

172, 165, 177, 169, 180

averages

To find the mean height of the boys, we take $\frac{172 + 165 + 177 + 169 + 180}{5} = 172.6$.
 \therefore mean height is 172.6 cm.

frequency table

When data is grouped into class intervals, we use a **frequency table** to represent the data.

The frequency table shows the Mathematics quiz scores of 40 students.

Quiz score (x)	Frequency
$0 < x \leq 5$	1
$5 < x \leq 10$	7
$10 < x \leq 15$	23
$15 < x \leq 20$	9

To find the mean of the grouped data with class intervals, we use the class mid-value to estimate the mean score of the class.

$$\begin{aligned} \text{Estimated mean score of 40 students} &= \frac{(2.5)(1) + (7.5)(7) + (12.5)(23) + (17.5)(9)}{40} \\ &= 12.5 \text{ marks} \end{aligned}$$

1 Find the mean of each of the following set of numbers.

(a) 1, 5, 8, 16, 20

(b) 4.4, 2.8, 9.5, 11.8, 23.5

2 Find an expression for the mean of each of the following set of numbers.

(a) $3x$, $9x$, $15x$, $24x$, $29x$

(b) $4y - 1$, $4 + y$, $21 - 5y$, $3 - 3y$, $11 + 2y$

3 (a) The mean of six numbers is 17. Find the sum of these six numbers.

(b) The sum of the values in a data set is 77. The mean of the data set is 5.5.
Find the number of values in the data set.

- 4 Find the mean of x for each of the following distributions.

(a)

Age (x years)	10	11	12	13	14
Frequency	9	7	12	6	6

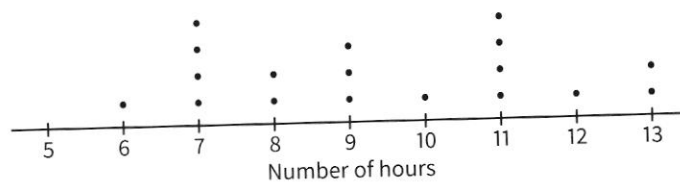
(b)

Travelling time (x min)	$0 < x \leq 10$	$10 < x \leq 20$	$20 < x \leq 30$	$30 < x \leq 40$	$40 < x \leq 50$
Frequency	11	12	6	16	8

INTERMEDIATE

- 5 A survey is conducted on a group of students to find out the number of hours they spend on the Internet in a week. The dot diagram shows the results of the survey.

Number of hours spent on the Internet in a week



Find

- (a) the number of students who took part in the survey,
- (b) the total number of hours spent on the Internet,
- (c) the mean number of hours spent on the Internet.

- 6 The stem-and-leaf diagram shows the heights (in cm) of plants in a nursery.

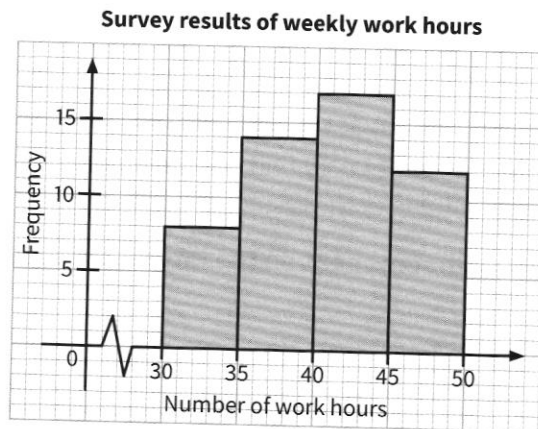
Heights of plants	
Stem	Leaf
12	4 5 5 7 8
13	1 1 2 3 6 6 6 8 9 9
14	0 6 7 7 8

Key: 12 | 4 represents 124 cm.

Find

- (a) the number of plants,
- (b) the mean height of the plants.

- 7 The histogram shows the survey results of the number of weekly work hours of a group of adults.



Find

- (a) the number of adults who took part in the survey,
- (b) an estimate of the mean number of work hours per week.