

A Averages, Quartiles and the Range

5 This is a list of test grades.

7 7 5 3 4 3 3 7 1 7 2 7

(a) Find the mode.

7 [1]

(b) Find the range.

$$7 - 1 = 6$$

6 [1]

7 These are the scores of 10 students in a test.

15 5 20 25 7 13 15 11 17 12

Find

(a) the range,

$$25 - 5 = 20$$

20 [1]

(b) the mean.

$$\frac{15 + 5 + 20 + 25 + 7 + 13 + 15 + 11 + 17 + 12}{10} = \frac{140}{10}$$

= 14 [2]

3 (a) Zoe's test scores last term were 6 7 7 7 8 9 9 10 10.

Find

(i) the range,

$$10 - 6 = 4$$

4 [1]

(ii) the mode,

7 [1]

(iii) the median.

8 [1]

- 1 These are the scores of 10 students in a test.

7 15 9 4 16 6 8 11 12 10

Find

- (a) the median, 4, 6, 7, 8, 9, 10, 11, 12, 15, 16

$$\frac{9+10}{2} = 9.5$$

9.5 [2]

- (b) the mean.

$$\frac{7 + 15 + 9 + 4 + 16 + 6 + 8 + 11 + 12 + 10}{10} = \frac{98}{10}$$

9.8 [2]

- 8 Daryl records the number of hours in a week 8 people spend exercising.

5 2 1.5 3 18 4.5 2 4

- (a) Find the median. 1.5, 2, 2, 3, 4, 4.5, 5, 18

$$\frac{3+4}{2} = 3.5$$

3.5 h [2]

- (b) Explain why the mean may not be a suitable average to use.

Because it is affected by extreme values (18 in this case) [1]

- 4 The mean mass of four men in a rowing team is 97.5 kg.
The modal mass is 101 kg.
The range of the masses is 8 kg.

Find the mass of each of the four men.

Mode of 101 means there are at least two 101s:

$$x, y, 101, 101$$

Assuming 101 is the biggest number, use range:

$$\begin{aligned} 101 - y &= 8 \\ -y &= -93 \\ \underline{y} &= \underline{93} \end{aligned}$$

Mean:

$$\frac{93 + 101 + 101 + x}{4} = 97.5$$

$$\frac{295 + x}{4} = 97.5$$

$$\begin{aligned} 295 + x &= 390 \\ -295 & \quad -295 \end{aligned}$$

$$\underline{x = 95}$$

$$\underline{\quad 93 \quad} \text{ kg}, \underline{\quad 95 \quad} \text{ kg}, \underline{\quad 101 \quad} \text{ kg}, \underline{\quad 101 \quad} \text{ kg} [3]$$

- 14 The range, mode, median and mean of five positive integers are all equal to 10.

Find one possible set of these five integers.

Mode: At least two 10s

Median: Middle number is 10

Mean: All five must add up to 50

Range: Biggest - Smallest = 10

$$x + y = 20$$

$$x - y = 10$$

$$2x = 30$$

$$x = 15$$

$$y = 5$$

$$\underline{\quad 5 \quad}, \underline{\quad 10 \quad}, \underline{\quad 10 \quad}, \underline{\quad 10 \quad}, \underline{\quad 15 \quad} [4]$$

(other solutions are possible)

- 4 Write down an expression for the range of k consecutive integers.

e.g. 5 consecutive integers:

$$3, 4, 5, 6, 7$$

$$\begin{aligned} \text{Range} &= 7 - 3 \\ &= \underline{4} \end{aligned}$$

so range of
 k consecutive
integers must be $k-1$

$$\underline{\quad k-1 \quad}$$

[1]