6.2 Averages, grouped data and spread

Name: _____ Class: _____ Date: _____ **Total: 24 marks**

KEY WORDS median • interquartile range

Averages, grouped data and spread

Objective

Calculate mean, median, mode and range; estimate the grouped mean with midpoints; identify the modal class; find quartiles and the IQR by position (objectives Foundation 6.2 B–D and Higher 6.2 B–C).

1 Key knowledge and worked examples

Averages. Mean $= \sum x/n$; median orders and takes the middle; mode is most frequent. Grouped mean: midpoint m times frequency f, summed, over $\sum f$. For 3, 7, 8, 10, 12: mean 8, median 8, range 9.

Quartiles. Order, take the median, then the medians of the lower and upper halves are Q_1 and Q_3; IQR $= Q_3 - Q_1$. For 4, 6, 7, 9, 10, 12, 14, 15: median 9.5, $Q_1 = 6.5$, $Q_3 = 13$, IQR 6.5. The IQR resists outliers; the range does not.

2 Practice

2.1 Find the mean, median, mode and range of 2, 4, 4, 6, 9 [4]

2.2 Classes 0–10, 10–20, 20–30 have frequencies 5, 8, 7. Estimate the mean. [3]

2.3 For the same table, state the modal class. [1]

2.4 Find Q_1, Q_3 and the IQR of 3, 5, 6, 8, 9, 11, 12, 13, 15 [3]

3 Exam-style questions

3.1 *(Original.)* The masses (kg, to the nearest kg) of 10 bags are 12, 15, 15, 18, 20, 20, 20, 22, 25, 33. (a) Find the mean, median and mode. (b) The 33 is recorded in error as 73: state which of the three averages changes and which stays most representative. [5]

3.2 *(Original.)* Times are grouped 0–4, 4–8, 8–12, 12–20 minutes with frequencies 6, 10, 16, 8. (a) Estimate the mean. (b) State the modal class and explain why the final class can still be modal only if densities are compared. [5]

3.3 *(Original.)* Two classes sit the same test: Class A scores have median 54 and IQR 10; Class B median 58 and IQR 22. Compare their typical performance and consistency. [3]