

Comparing Data Sets

Maths

Level 2

Exam-style practice · 7 questions · 28 marks · Calculator allowed

Remember

Compare with two things: an average (usually the mean or median) tells you which set is typically higher; the range tells you which is more consistent.

The sentence pattern: 'Set A has a higher mean (34 vs 31), so A is typically Set B has a smaller range (9 vs 27), so B is more consistent/reliable.' Then answer the actual question: which would you choose, and why.

Choosing an average: mean uses all data but is pulled by extremes; median is better when there are outliers; mode for categories or 'most popular'.

Quote the numbers. 'A is better' with no figures scores nothing.

Section A – Compare the statistics

1. Two call-centre agents' call times (minutes) last Friday:

Priya: 4, 6, 5, 7, 5, 9, 4, 8 Tom: 3, 12, 4, 5, 11, 4, 3, 10

(a) Find the mean and range for each. (b) The manager wants calls to be short *and* predictable. Who should take priority customers? Give two reasons using your figures. (6 marks)

2. Two supermarket branches' daily takings over a week (£000s): Branch A mean 42.5, range 8. Branch B mean 44.0, range 31. Write two statements comparing the branches, and say which you would rather manage. (3 marks)

3. The median waiting time at Clinic X is 18 minutes with a range of 40. At Clinic Y it is 24 minutes with a range of 12. A patient wants to be seen quickly. Which clinic, and what is the risk? (3 marks)

Section B – Which average?

4. Salaries at a small firm: £22k, £24k, £24k, £26k, £27k, £29k, £95k. (a) Find the mean, median and mode. (b) The owner advertises 'average salary over £35,000'. Which average has been used, and why is it misleading? (4 marks)

5. Shoe sizes sold in a shop one day: 5, 6, 6, 7, 7, 7, 7, 8, 8, 9, 10. Which average should the shop use to decide what to stock more of? Explain. (2 marks)

6. Two mock-test groups: Group 1 scores 41, 58, 59, 60, 61, 62, 63. Group 2 scores 52, 55, 57, 60, 63, 66, 68. (a) Find the mean and median of each. (b) Which statistic gives a fairer comparison here, and why? (5 marks)

Section C – Full comparison

7. A council trialled two bin-collection routes for 10 days, recording minutes taken.

	Mean	Median	Range	Shortest	Longest
Route 1	212	210	28	198	226
Route 2	204	196	75	180	255

Write a short report (3–4 sentences) comparing the routes and recommending one. Crews must finish within their 4-hour (240-minute) shift. (5 marks)

Comparing Data Sets – Answers

Level 2 · Working shown so you can check your method, not just the final number.

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Section A

- (a) Priya: mean $48 \div 8 = 6$ min, range $9 - 4 = 5$. Tom: mean $52 \div 8 = 6.5$ min, range $12 - 3 = 9$. (b) **Priya**. Her mean is lower (6 vs 6.5), so her calls are shorter on average; her range is smaller (5 vs 9), so her call length is more predictable.
- Branch B has a higher mean (£44k vs £42.5k), so it takes more on a typical day. Branch A has a much smaller range (8 vs 31), so its takings are steadier. Most would choose **A** for predictability, or B for higher income – either with the reasoning.
- Clinic X** – typical wait is shorter (18 vs 24 min). The risk: X's range is 40, so some waits are far longer than typical; Y is slower but more consistent.

Section B

- (a) Mean = $247 \div 7 = \text{£}35,286$; median **£26k**; mode **£24k**. (b) The **mean**, pulled up by the £95k salary. Six of the seven staff earn under £30k; the median gives a truer picture.
- The **mode** (7) – the shop needs to know the most common size sold; the mean (7.3) is not a size anyone wears.
- (a) Group 1: mean $404 \div 7 = 57.7$, median **60**. Group 2: mean $421 \div 7 = 60.1$, median **60**. (b) The **median**: Group 1 has an outlier (41) that drags its mean down; the medians show the groups are actually level.

Section C

- Route 2 is faster on average (mean 204 vs 212; median 196 vs 210). However, Route 2 is far less consistent (range 75 vs 28) and its longest day, 255 minutes, breaks the 240-minute shift, whereas Route 1 never exceeds 226. **Recommend Route 1**: it always fits the shift and the time saved by Route 2 (about 8 minutes a day) does not justify the risk of overruns. (Marks: average compared with figures, spread compared with figures, reference to the 240-min limit, clear recommendation.)

Where Level 2 students lose marks on this topic

- Comparing only the averages. The range (spread/consistency) is half the marks.
- Quoting the numbers without saying what they mean – 'Priya's range is 5' needs 'so her calls are more predictable'.
- Choosing the mean when an outlier distorts it. If one value is wildly different, say so and use the median.