



eClassroom

GCSE Mathematics

Comparing Distributions

Worked Solutions

Pearson Edexcel GCSE & iGCSE Mathematics



Section A — Foundation — Worked Solutions

[Fluency] Question 1

B has higher mean (15 vs 12) and higher median (14 vs 11) so typically higher values.

B has greater range (12 vs 8) so results are more spread out / less consistent.

∴ **B has higher average; B has greater spread.**

[Fluency] Question 2

(a) Class A median≈64, Class B median≈57.5

(b) Class A IQR≈19, Class B IQR≈21

(c) Class A has a higher median so performed better on average. Class B has a greater IQR so results are less consistent.

∴ **(a) A:64, B:57.5 (b) A:19, B:21 (c) A higher median, B more spread**

[Reasoning] Question 3

$$A: \text{mean} = \frac{10 \times 2 + 30 \times 8 + 50 \times 15 + 70 \times 12 + 90 \times 3}{40} = \frac{2060}{40} = 51.5$$

$$B: \text{mean} = \frac{10 \times 5 + 30 \times 12 + 50 \times 18 + 70 \times 8 + 90 \times 2}{45} = \frac{2100}{45} = 46.7$$

(b) Class A has a higher estimated mean (51.5 vs 46.7), so performed better on average.

∴ **(a) A: 51.5, B: 46.7 (b) Class A performed better on average**

[Reasoning] Question 4

Group A sorted: 52,55,58,61,64,67,70,72,75. Median=64, Range=23

Group B sorted: 48,53,56,60,63,68,71,74,78. Median=63, Range=30

Group A has a slightly higher median (64 vs 63). Group B has a greater range (30 vs 23).

∴ **Group A: median=64, range=23. Group B: median=63, range=30.**

[Reasoning] Question 5

Factory A has a smaller standard deviation (0.3 vs 1.2), meaning less variation in bolt length.

Factory A produces more consistent bolts.

∴ **Factory A — smaller standard deviation means less variation.**





[Problem Solving] Question 6

Boys: min=42, LQ=55, med=65, UQ=75, max=92. Girls: min=48, LQ=60, med=68, UQ=76, max=88

Girls have higher median (68 vs 65) and higher LQ (60 vs 55) → performed better on average

Boys have greater range (50 vs 40) → results more spread out

Girls' IQR=16, Boys' IQR=20 → girls more consistent

∴ Girls: higher median (68 vs 65), more consistent (IQR 16 vs 20). Boys: wider range.





Section B — Higher — Worked Solutions

[Fluency] Question 1

Beta has a higher mean (67.1 vs 62.4) and similar median (65 vs 64) → performed better on average.

Alpha has a greater range (58 vs 72... wait: Beta range=72 > Alpha=58) → Beta has greater spread.

Beta has smaller IQR (18 vs 22) → Beta's central 50% more consistent despite wider overall range.

Beta's larger range may be due to outliers at extremes.

∴ **Beta: higher mean; Alpha: smaller IQR (more consistent middle 50%).**

[Fluency] Question 2

Year 11: higher median (65 vs 58) → performed better on average.

Year 11: greater IQR (78-50=28 vs 70-45=25) → slightly more spread in middle 50%.

Year 11: greater range (95-25=70 vs 90-30=60) → more extreme values.

∴ **Year 11 higher median; slightly greater spread. Year 11 performed better overall.**

[Reasoning] Question 3

Mon CF: 5,20,38,50. Fri CF: 8,28,42,50.

Mon median at 25th → in 20-30: $20 + \frac{(25-20)}{18} \times 10 \approx 22.8$

Fri median at 25th → in 10-20: $10 + \frac{(25-8)}{20} \times 10 \approx 18.5$

Mon IQR: LQ \approx 14, UQ \approx 29, IQR \approx 15. Fri IQR: LQ \approx 12, UQ \approx 27, IQR \approx 15

Monday has higher median (22.8 vs 18.5) — journeys longer on Monday. Similar IQR.

∴ **Monday: higher median (\approx 22.8 vs 18.5 min). Similar IQR — consistent spread.**

[Reasoning] Question 4

A higher mean just means the average is higher — individual values can overlap.

Example: A = {1, 1, 20} mean=7.3, B = {5, 6, 7} mean=6. A has higher mean but most B values exceed most A values.

∴ **Higher mean does not mean every value is higher — distributions can overlap.**



[Problem Solving] Question 5

Both classes have the same mean (58) — on average performed equally.

Class Y has much smaller range (18 vs 40) → results far more consistent.

A student might prefer Class Y: more predictable performance, less risk of very low marks.

Class X may be preferred if a student is high-ability and could be in the top range.

∴ Equal means; Y far more consistent (range 18 vs 40). Prefer Y for consistency.

[Problem Solving] Question 6

(a) Histogram: most data in 20-30 range (highest bar), right of centre — slight negative skew. Box plot: median around 22, whiskers fairly even — roughly symmetric to slight right skew.

(b) The data may have a slight skew. The median is unaffected by extreme values, making it more representative than the mean.

∴ (a) Roughly symmetric, slight positive skew (b) Median robust to skew/outliers