

Comparing Two Data Sets with Variability

Grade 7 math · Test Answer Key · Standards: 7.SP.B.3, 7.SP.B.4

The answer key shows every calculation and a scoring guide. Award partial credit when a student lists correct distances from the mean but makes a small addition error, and check that units are included where given.

Standards: 7.SP.B.3, 7.SP.B.4 · **Level:** Grade 7

Question 1 Mean and MAD (2 points)

- a. Sum 80, so the mean is $80 \div 5 = \mathbf{16 \text{ books}}$.
- b. Distances: 2, 2, 4, 0, 4. Sum 12. $\text{MAD} = 12 \div 5 = \mathbf{2.4 \text{ books}}$.

Scoring: 1 point for each part.

Question 2 Two dot plots (3 points)

- a. Team X: $50 \div 10 = \mathbf{5}$. Team Y: $70 \div 10 = \mathbf{7}$.
- b. Distances for X: 2, 1, 1, 0, 0, 0, 0, 1, 1, 2. Sum 8. $\text{MAD} = 8 \div 10 = \mathbf{0.8}$.
- c. Difference: $7 - 5 = 2$. $2 \div 0.8 = \mathbf{2.5 \text{ MADs}}$.

Scoring: 1 point for each part.

Question 3 Two box plots (3 points)

- a. Class A: **26**. Class B: **38**.
- b. Class A: $32 - 20 = \mathbf{12}$. Class B: $44 - 32 = \mathbf{12}$.
- c. $38 - 26 = 12$, and $12 \div 12 = \mathbf{1 \text{ IQR}}$.

Scoring: 1 point for each part.

Question 4 Quartiles from a list (2 points)

The median is the middle (4th) value: **12**.

Lower half: 4, 7, 9 gives $Q1 = 7$. Upper half: 15, 18, 22 gives $Q3 = 18$. $\text{IQR} = 18 - 7 = \mathbf{11}$.

Scoring: 1 point for the median, 1 point for the IQR.

Question 5 Cookie weights (3 points)

- a. A: $180 \div 6 = 30$ g. B: $210 \div 6 = 35$ g.
b. A: distances 2, 0, 1, 1, 0, 2 sum 6, MAD = **1** g. B: distances 2, 0, 1, 1, 0, 2 sum 6, MAD = **1** g.
c. $35 - 30 = 5$, and $5 \div 1 = 5$ MADs.

Scoring: 1 point for each part.

Question 6 Same median, different spread (2 points)

Set 1 is more consistent. Its middle half of values is within 4 units, while the middle half of Set 2 is spread over 20 units.

Set 1

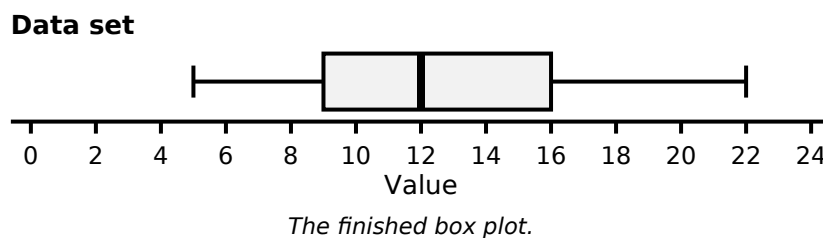
Scoring: 1 point for choosing Set 1, 1 point for the reason using IQR.

Question 7 Draw a box plot (3 points)

Draw whiskers to 5 and 22, a box from 9 to 16, and a line in the box at 12. Range: $22 - 5 = 17$. IQR: $16 - 9 = 7$.

range 17; IQR 7

Scoring: 1 point for a correct box plot, 1 point for the range, 1 point for the IQR.



Question 8 Two teams (2 points)

- a. $72 - 62 = 10$, and $10 \div 5 = 2$ MADs.
b. A gap of 2 MADs means the typical scores are well separated, though some scores overlap, so the teams differ **noticeably**.

Scoring: 1 point for each part.