

# Grade 7 · Comparing Two Populations · Test Answer Key

Common Core 7.SP.B.3, 7.SP.B.4 · mathovore.fr

Use this key to grade the 20-point test on comparing two populations. Each solution shows the full work, and the scoring note after it tells how the points are earned. Give partial credit when the method is right but one calculation is wrong.

## Grade 7 Common Core: 7.SP.B.3 · 7.SP.B.4

### Question 1: Median and IQR (2 points)

Order the data: 27, 29, 31, 33, 35, 38, 40. The median is the middle value, **33**.

Lower half: 27, 29, 31, so  $Q_1 = 29$ . Upper half: 35, 38, 40, so  $Q_3 = 38$ .

$IQR = 38 - 29 = 9$ . The IQR is **9**.

Scoring: 1 point for the median; 1 point for the quartiles and the IQR.

### Question 2: Two practice groups (3 points)

(a) Group 1: the sum is 40, so the mean is  $40 \div 8 = 5$ . Group 2: the sum is 64, so the mean is  $64 \div 8 = 8$ .

(b) Group 1 distances: 2, 1, 1, 0, 0, 1, 1, 2, total 8, so the MAD is  $8 \div 8 = 1$ . Group 2 distances: 2, 1, 1, 0, 0, 1, 1, 2, total 8, so the MAD is 1.

(c)  $8 - 5 = 3$  and  $3 \div 1 = 3$ . The means are **3 MADs** apart.

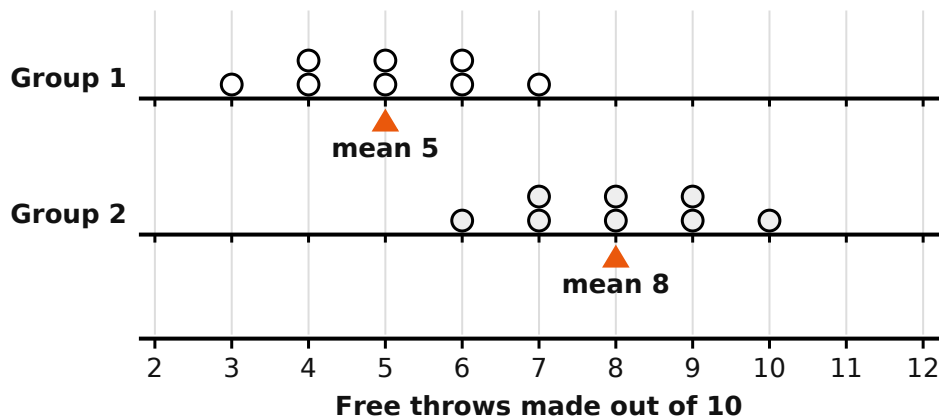


Figure. Means: Group 1 is 5, Group 2 is 8.

Scoring: 1 point for (a) both means; 1 point for (b) both MADs; 1 point for (c) the multiple.

### Question 3: Text messages (2 points)

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(a) The difference is  $66 - 48 = 18$ , and  $18 \div 9 = 2$ . The means are **2 MADs** apart.

(b)  $18 \div 6 = 3$ . With a MAD of 6 the means are **3 MADs** apart.

Scoring: 1 point for each part (correct difference and division).

### Question 4: Biking clubs (3 points)

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(a) Club X median 28, Club Y median 40. The difference is  $40 - 28 = 12$  miles.

(b) Club X:  $36 - 20 = 16$ . Club Y:  $48 - 24 = 24$ . The IQRs are **16 and 24** miles.

(c) The box of Club X spans 20 to 36 and the box of Club Y spans 24 to 48. They share the values from 24 to 36, so the boxes **overlap**.

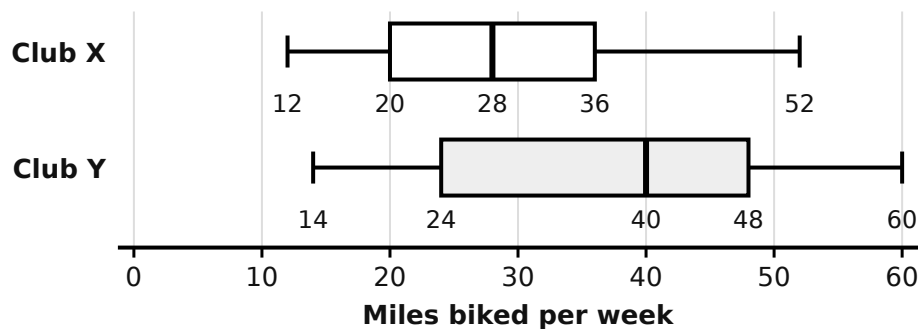


Figure. Five numbers written under each box plot.

Scoring: 1 point for (a), 1 point for (b), 1 point for (c) with the overlap explained.

### Question 5: Typing speeds (3 points)

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(a) Class 1: the sum is 400, so the mean is 40. Class 2: the sum is 440, so the mean is 44.

(b)  $44 - 40 = 4$  and  $4 \div 2 = 2$ . The means are **2 MADs** apart.

(c) The values of Class 1 range from 36 to 44 and the values of Class 2 range from 41 to 50. They overlap from 41 to 44, so the overlap is small, but the typical value of Class 2 is higher.

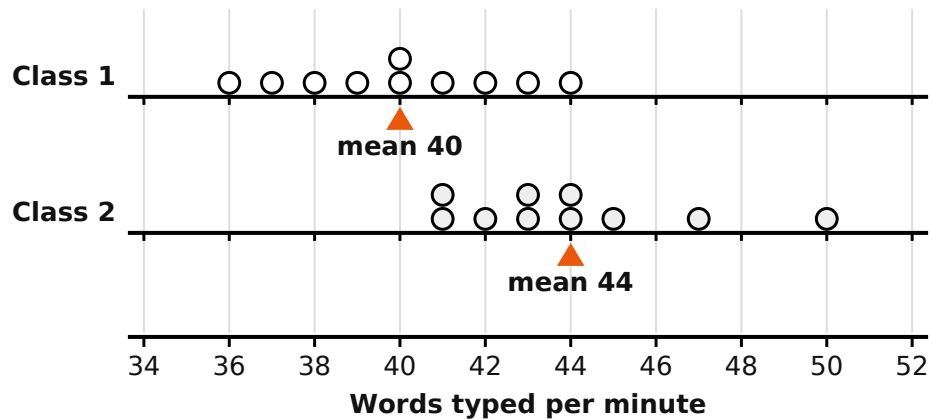


Figure. Means: Class 1 is 40, Class 2 is 44.

*Scoring: 1 point for both means; 1 point for the multiple; 1 point for a correct description of the overlap.*

### Question 6: Pages read (3 points)

(a) Sixth grade: the sum is 240, so the mean is  $240 \div 8 = 30$ . Distances: 7, 6, 3, 0, 1, 4, 4, 7, total 32, so the MAD is  $32 \div 8 = 4$ .

Seventh grade: the sum is 304, so the mean is  $304 \div 8 = 38$ . Distances: 6, 5, 4, 1, 0, 4, 4, 8, total 32, so the MAD is 4.

(b)  $38 - 30 = 8$  and  $8 \div 4 = 2$ . Seventh graders typically read about 8 pages, or 2 MADs, more per week than sixth graders.

*Scoring: 1 point for both means; 1 point for both MADs; 1 point for the multiple in a comparing sentence.*

### Question 7: Find the error (2 points)

The difference of the means is  $80 - 70 = 10$ . Jamal stopped there. He must divide by the MAD:  $10 \div 5 = 2$ .

Group B is **2 MADs** higher, not 10 MADs.

*Scoring: 1 point for explaining that the difference must be divided by the MAD; 1 point for the correct multiple, 2.*

### Question 8: Working backward (2 points)

(a) The difference is  $150 - 120 = 30$ . Then  $30 \div 2.5 = 12$ . The MAD is **12**.

(b)  $1.5 \times 12 = 18$  and  $150 + 18 = 168$ . The mean is **168**.

*Scoring: 1 point for each part.*

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|------------------|
| <b>Total</b>     |
| <b>20 points</b> |