MATHEMATICS · GRADES 7-9

Comparing Data Sets

Difficulty level: Intermediate

Mathematics: Grades 7-9

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Overview of the concept

This is how you judge two groups side by side, like two classes' test scores or two teams' results. You compare their typical scores and their spread instead of one single result, because one high score does not make a whole class better. It is the fair way to compare groups, and it is how coaches and teachers actually judge performance.



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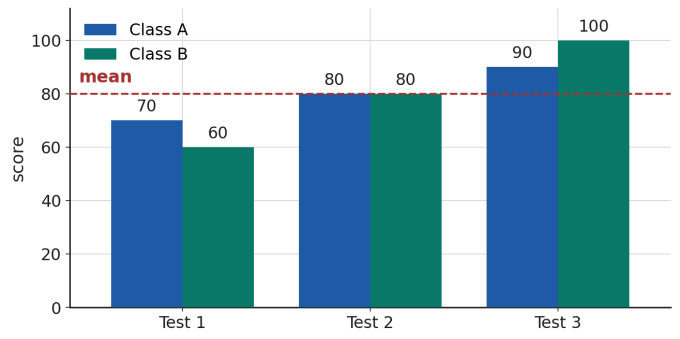
Worked examples

EXAMPLE 1

Q Class A scores on three tests: 70, 80, 90. Class B scores: 60, 80, 100. Compare their means and ranges.



SOLUTION

Class A mean: $\frac{(70 + 80 + 90)}{3} = 80$. Class B mean: $\frac{(60 + 80 + 100)}{3} = 80$.

Class A range: 90 - 70 = 20. Class B range: 100 - 60 = 40.

Same mean, 80, but Class B is more spread out.

EXAMPLE 2

Q Data set P: 5, 5, 5. Data set Q: 1, 5, 9. Compare.

SOLUTION

Both means are 5: P $\frac{(5 + 5 + 5)}{3} = 5$; Q $\frac{(1 + 5 + 9)}{3} = 5$.

Ranges: P 0, Q 8

Same centre, but Q is more spread out.

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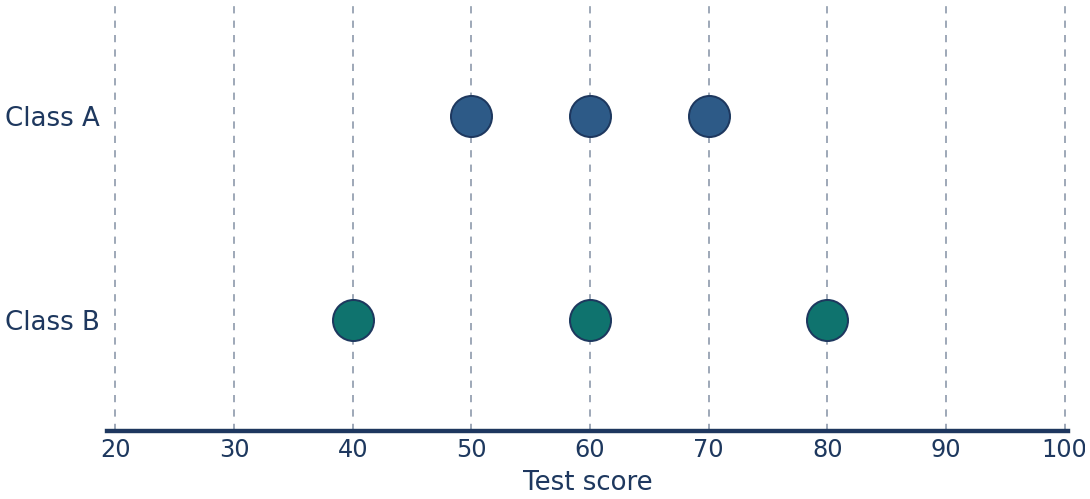
Practice questions

1 Two classes took the same test. The dot plots show their scores. Both classes have the same mean. What is that mean, and which class has the larger range?



A Mean 60; Class A is more spread out, range 40 against 20.

B Mean 70; Class B is more spread out, range 40 against 20.

C Mean 60; Class B is more spread out, range 40 against 20.

D Mean 60; Class B is more spread out, range 20 against 40.

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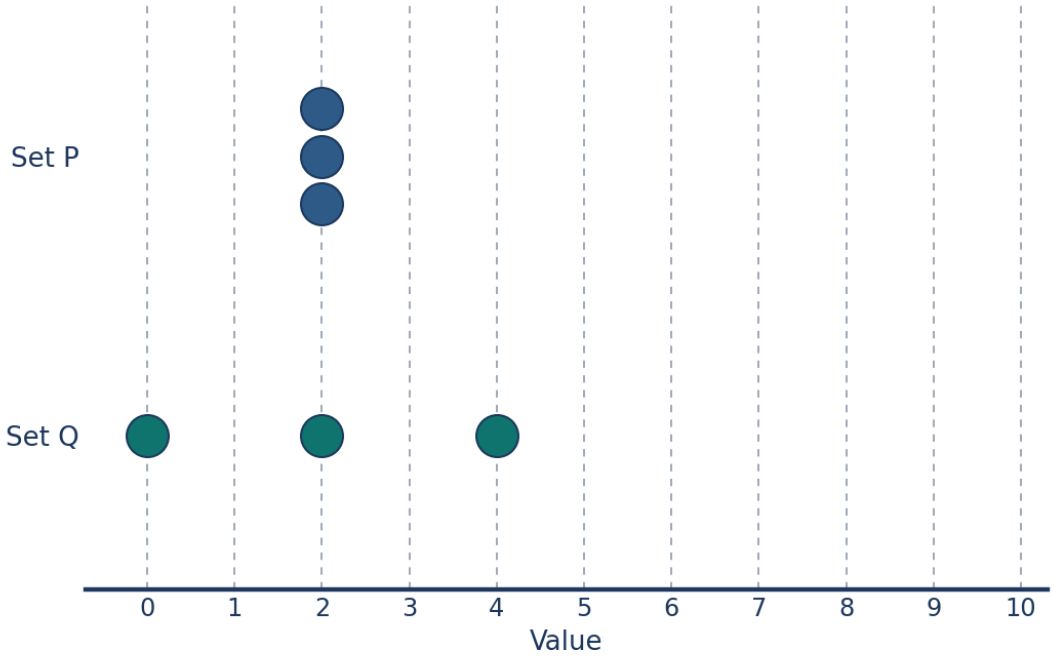
2 Two data sets, P and Q, are shown in the dot plots. What is the median of Set Q?



A 0

B 2

C 4

D 1

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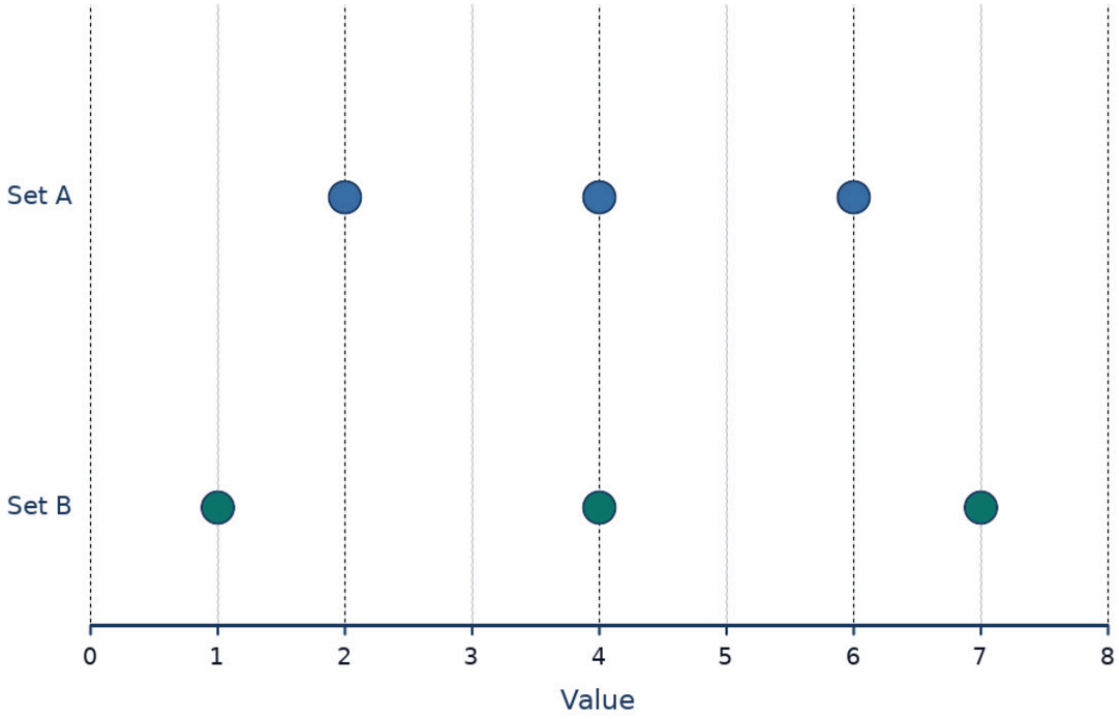
3 **Swimmer A and swimmer B counted their laps each day. The dot plots show the counts. Which swimmer is more consistent, and why?**



- **A** Swimmer A, because its range is smaller
- **B** Swimmer B, because its range is smaller
- **C** Swimmer A, because its mean is bigger
- **D** Swimmer B, because its mean is bigger

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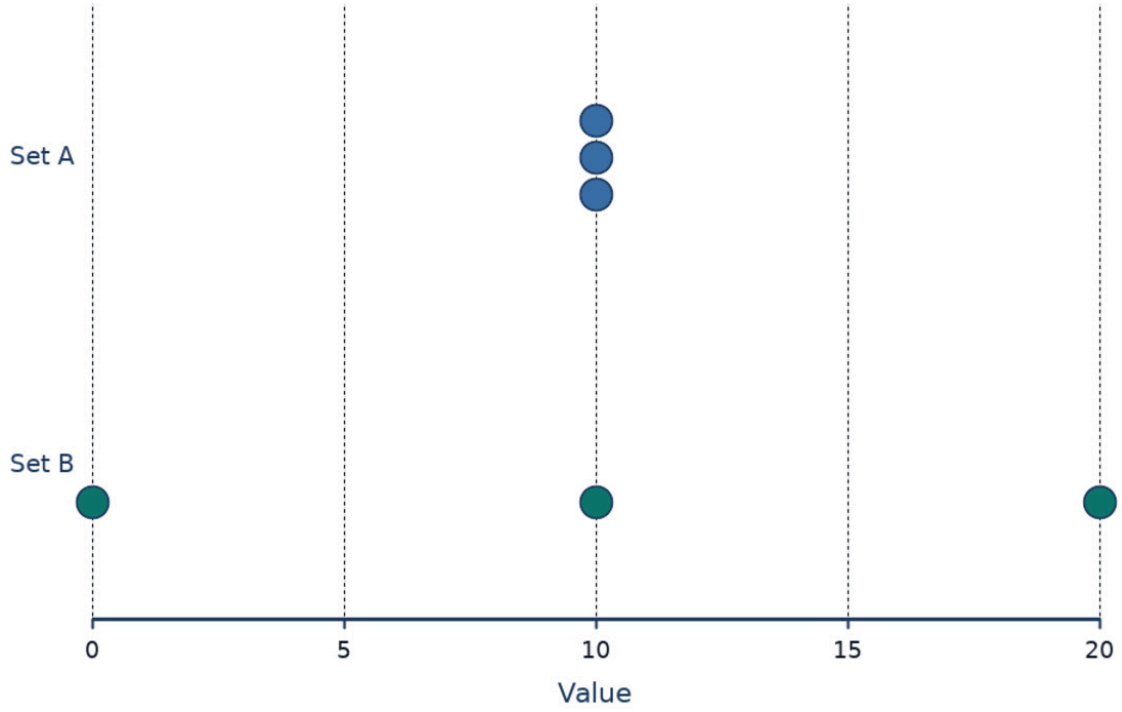
4 Two teams counted the goals they scored. The dot plots show the counts. What does Set A's range of 0 tell you?



A Every value in Set A is the same

B Set A has no values

C Set A's mean is 0

D Set A is more spread out than Set B

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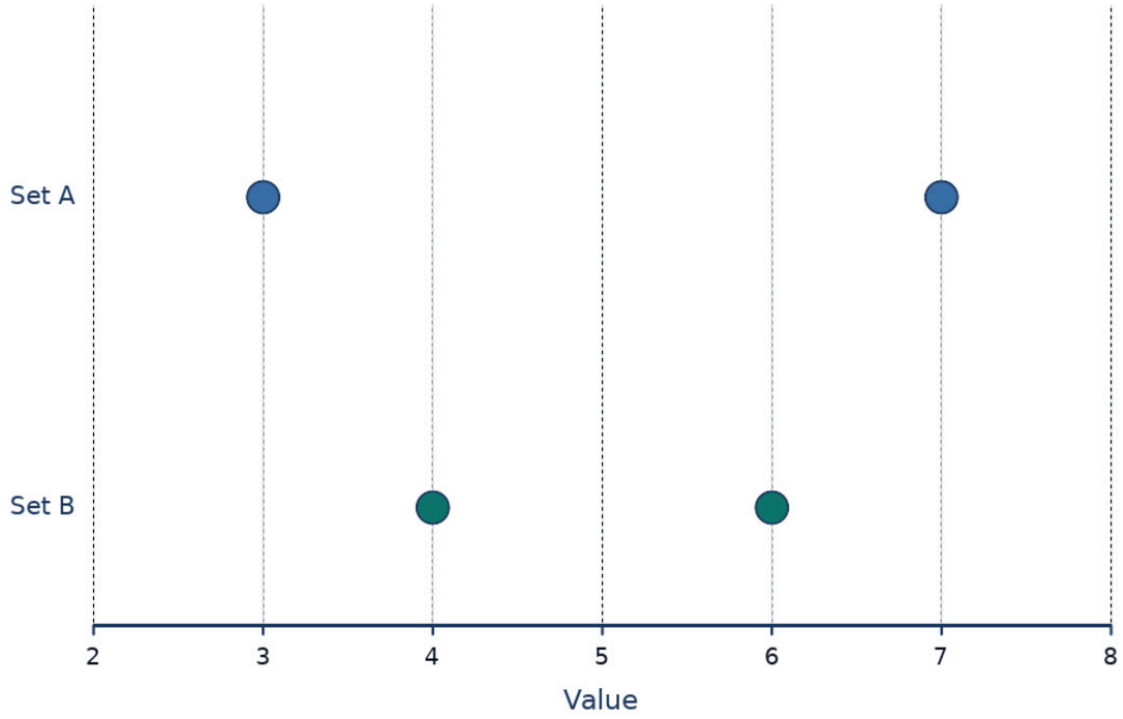
5 Two students counted the books they read each week. The dot plots show the counts. If the student in Set A reads 5 books one more week, what happens to Set A's mean?



A It stays at 5

B It goes up to 6

C It goes down to 4

D It becomes 7

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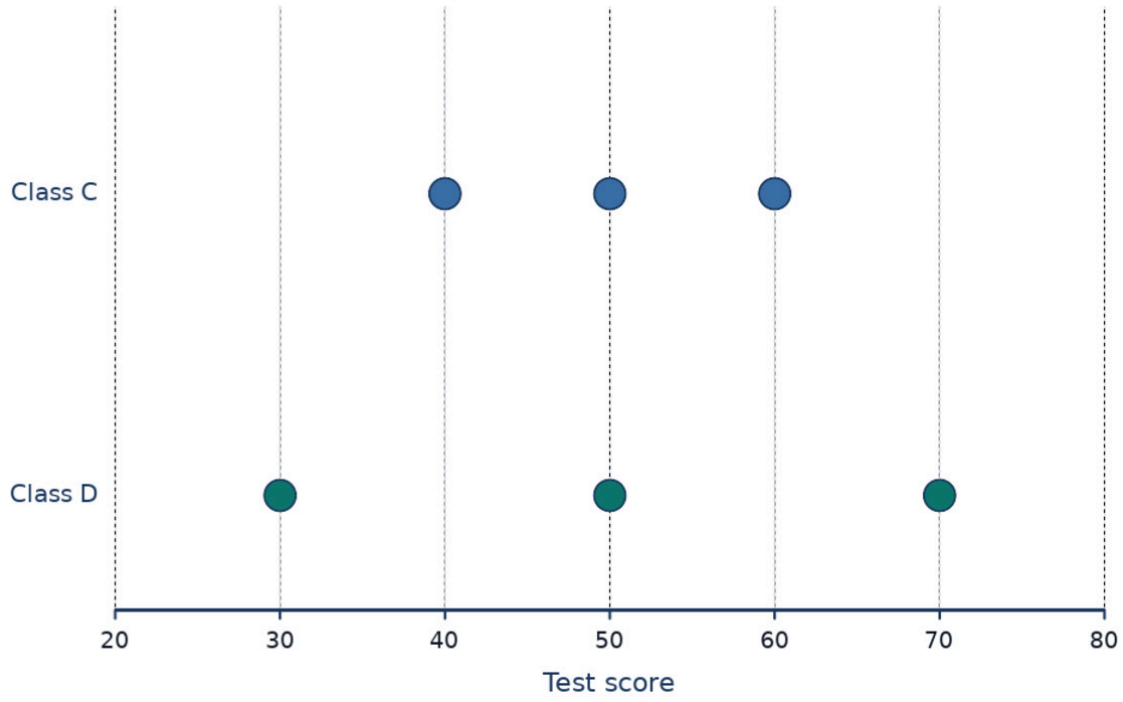
6 Class C and Class D took the same quiz. The dot plots show their scores. What is the difference between the two classes' ranges?



A 10

B 20

C 30

D 40

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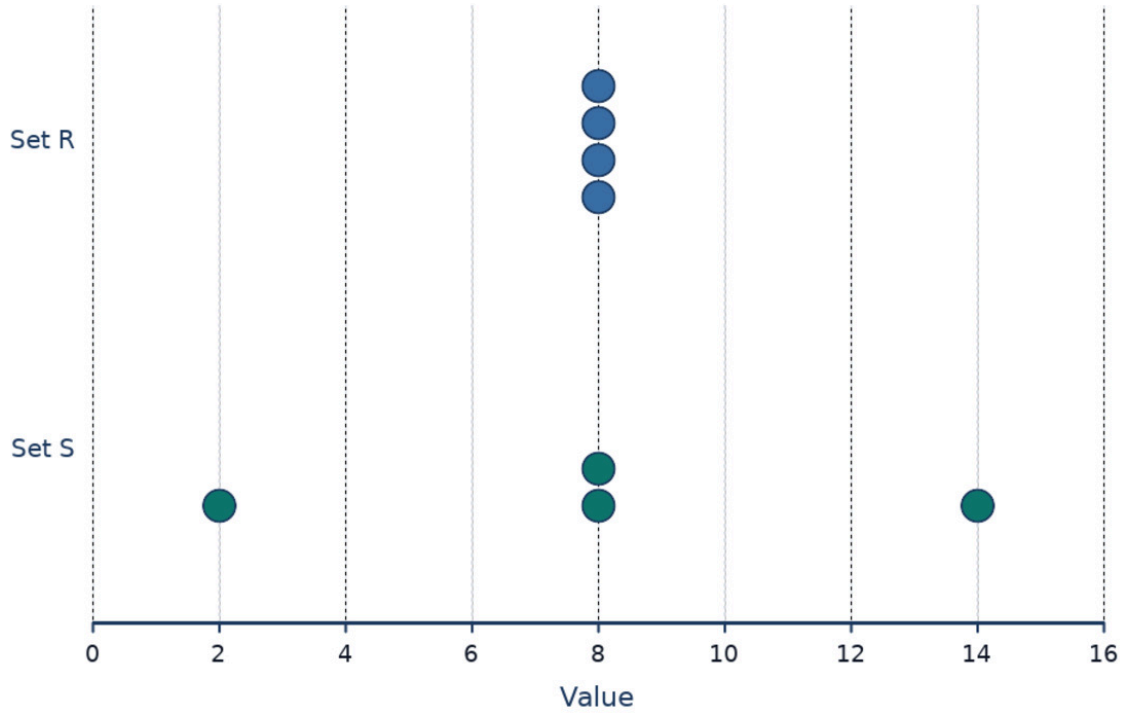
7 Two teams recorded the points they scored in four games. The dot plots show the points. What is the total of Set S's points?



A 32

B 8

C 24

D 40

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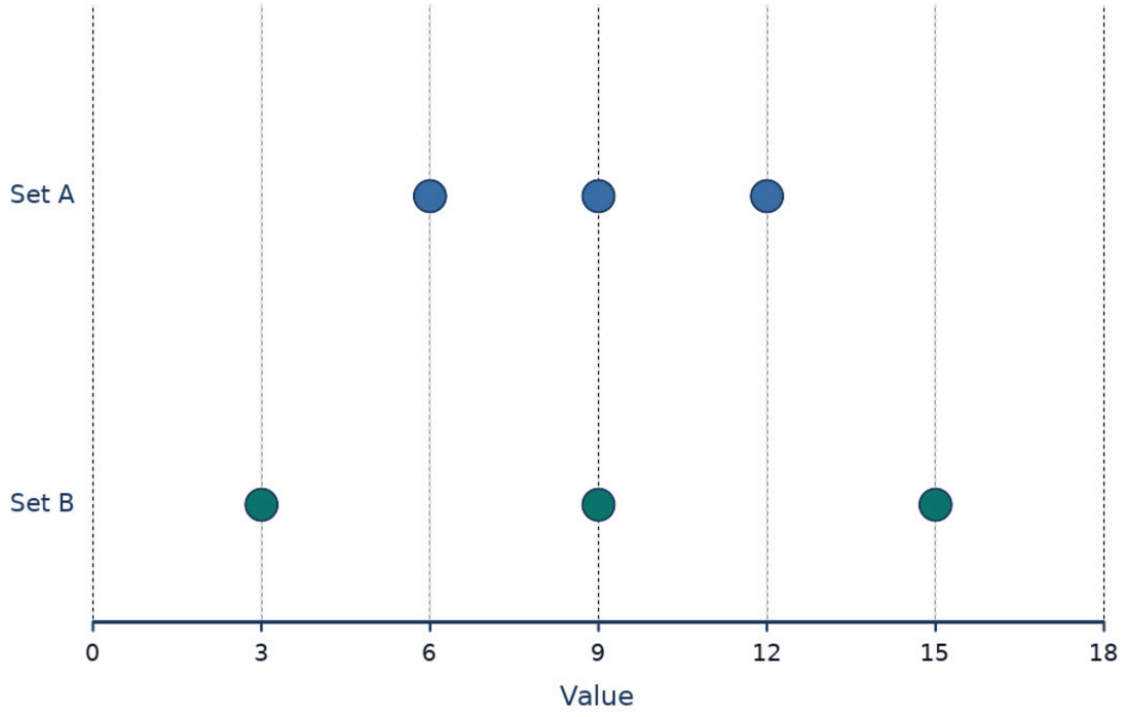
8 **Two students timed their reading in minutes. The dot plots show the times. If Set B's smallest value (3) is removed, what is the new mean of Set B?**



A 9

B 12

C 15

D 6

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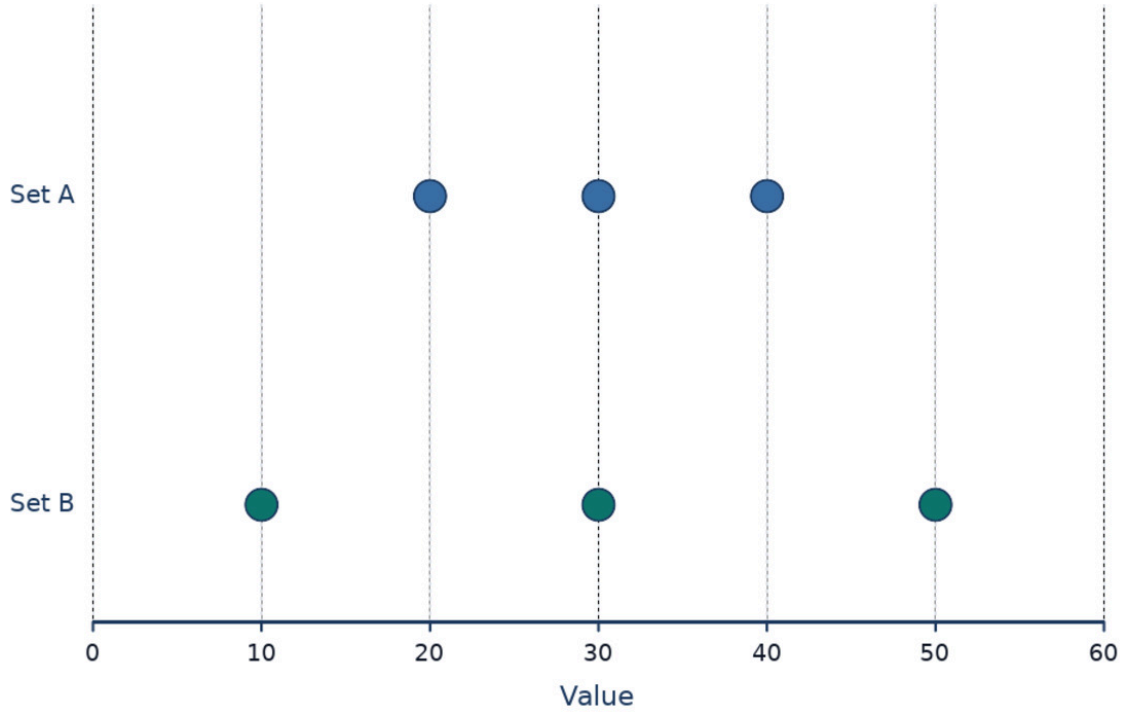
9

The ages of the players on two teams are shown in the dot plots. If Set A's largest value (40) is removed, what is the new range of Set A?



A 10

B 20

C 30

D 40

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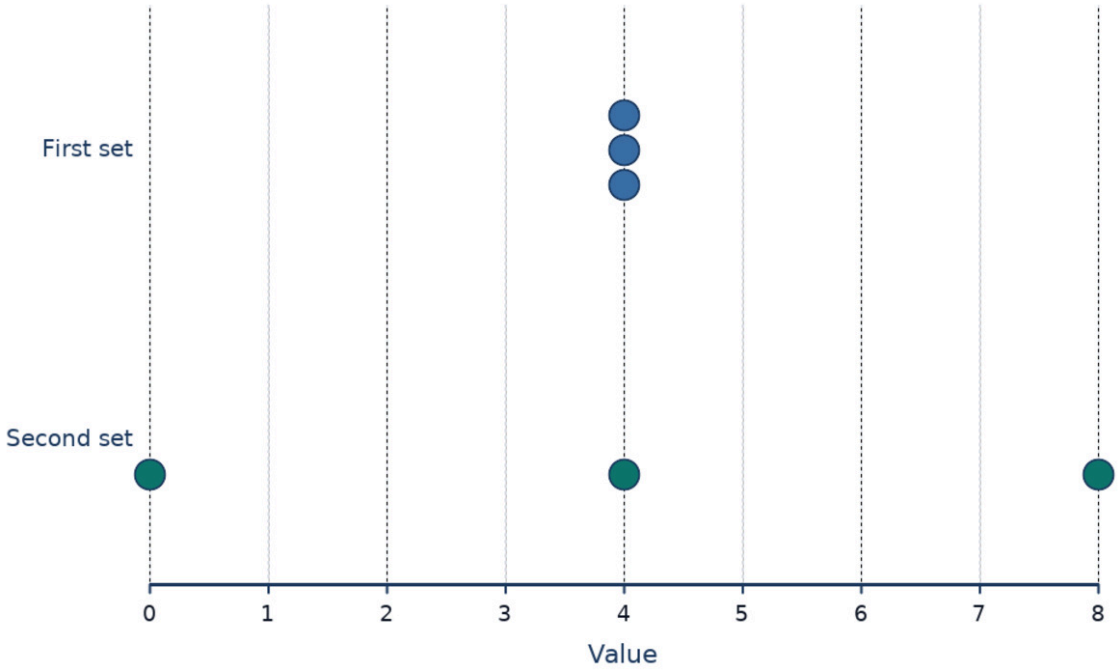
10 **Two dot plots are shown. Which set has range 0, and which one has range 8?**



A The second set has range 0; the first set has range 8.

B The first set has range 8; the second set has range 0.

C The first set has range 0; the second set has range 8.

D The first set has range 4; the second set has range 4.

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ANSWER KEY

1. Mean 60; Class B is more spread out, range 40 against 20.

2. 2

3. Swimmer A, because its range is smaller

4. Every value in Set A is the same

5. It stays at 5

6. 20

7. 32

8. 12

9. 10

10. The first set has range 0; the second set has range 8.

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