Summarizing Data and Making Comparisons

Summarizing and comparing data: Models and calculations

Name _____ **Date** _____ **Score** _____ / 6

QUICK REVIEW

Compare groups using the same measure and units. For A: $4, 5, 6$ and B: $1, 5, 9$, both means are 5, but ranges are 2 and 8, so A is more consistent by range. A larger mean is not always better: for wait times, a smaller mean is usually preferred. State the criterion rather than making an unsupported overall judgment.

Worked example

Find center and range; choose the more consistent group. A: $4, 5, 6$. B: $1, 5, 9$. Use the range for the decision.

1. A sum $= 15$, count 3, mean $= 15/3 = 5$; sorted $4, 5, 6$ gives median 5.
2. B sum $= 15$, count 3, mean $= 15/3 = 5$; sorted $1, 5, 9$ gives median 5.
3. Ranges: A $= 6 - 4 = 2$; B $= 9 - 1 = 8$. A is more consistent by range.
Answer: A: mean 5, median 5, range 2. B: mean 5, median 5, range 8. A is more consistent by range.

Practice Problems

Show your thinking.

1. Compare the centers. A: $2, 4, 6$. B: $4, 6, 8$. Use the mean for the decision.

2. Compare variation even when centers match. A: $3, 5, 7$. B: $1, 5, 9$. Use the range for the decision.

3. Compare typical values using the median. A: $1, 2, 9$. B: $3, 4, 5$. Use the median for the decision.

4. Choose the more consistent set of delivery times. A: $10, 12, 14$. B: $8, 12, 16$. Use the range for the decision.

5. Recover which group has the greater mean. A: $2, 3, 4, 5$. B: $4, 5, 6, 7$. Use the mean for the decision.

6. A student says equal means imply equal spread. Correct the claim. A: $4, 6, 8$. B: $1, 6, 11$. Use the range for the decision.

Answer Key

1. A: mean 4, median 4, range 4. B: mean 6, median 6, range 4. B has the greater mean.
2. A: mean 5, median 5, range 4. B: mean 5, median 5, range 8. A is more consistent by range.
3. A: mean 4, median 2, range 8. B: mean 4, median 4, range 2. B has the greater median.
4. A: mean 12, median 12, range 4. B: mean 12, median 12, range 8. A is more consistent by range.
5. A: mean $\frac{7}{2}$, median $\frac{7}{2}$, range 3. B: mean $\frac{11}{2}$, median $\frac{11}{2}$, range 3. B has the greater mean.
6. A: mean 6, median 6, range 4. B: mean 6, median 6, range 10. A is more consistent by range.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. A sum $= 12$, count 3, mean $= 12/3 = 4$; sorted $2, 4, 6$ gives median 4.
2. B sum $= 18$, count 3, mean $= 18/3 = 6$; sorted $4, 6, 8$ gives median 6.
3. Ranges: A $= 6 - 2 = 4$; B $= 8 - 4 = 4$. B has the greater mean.

Problem 2

1. A sum $= 15$, count 3, mean $= 15/3 = 5$; sorted $3, 5, 7$ gives median 5.
2. B sum $= 15$, count 3, mean $= 15/3 = 5$; sorted $1, 5, 9$ gives median 5.
3. Ranges: A $= 7 - 3 = 4$; B $= 9 - 1 = 8$. A is more consistent by range.

Problem 3

1. A sum $= 12$, count 3, mean $= 12/3 = 4$; sorted $1, 2, 9$ gives median 2.
2. B sum $= 12$, count 3, mean $= 12/3 = 4$; sorted $3, 4, 5$ gives median 4.
3. Ranges: A $= 9 - 1 = 8$; B $= 5 - 3 = 2$. B has the greater median.

Problem 4

1. A sum $= 36$, count 3, mean $= 36/3 = 12$; sorted $10, 12, 14$ gives median 12.
2. B sum $= 36$, count 3, mean $= 36/3 = 12$; sorted $8, 12, 16$ gives median 12.
3. Ranges: A $= 14 - 10 = 4$; B $= 16 - 8 = 8$. A is more consistent by range.

Problem 5

1. A sum $= 14$, count 4, mean $= 14/4 = \frac{7}{2}$; sorted $2, 3, 4, 5$ gives median $\frac{7}{2}$.
2. B sum $= 22$, count 4, mean $= 22/4 = \frac{11}{2}$; sorted $4, 5, 6, 7$ gives median $\frac{11}{2}$.
3. Ranges: A $= 5 - 2 = 3$; B $= 7 - 4 = 3$. B has the greater mean.

Problem 6

1. A sum $= 18$, count 3, mean $= 18/3 = 6$; sorted $4, 6, 8$ gives median 6.
2. B sum $= 18$, count 3, mean $= 18/3 = 6$; sorted $1, 6, 11$ gives median 6.
3. Ranges: A $= 8 - 4 = 4$; B $= 11 - 1 = 10$. A is more consistent by range.

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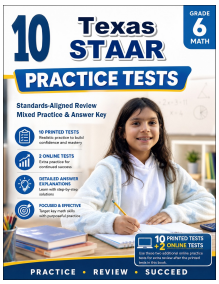

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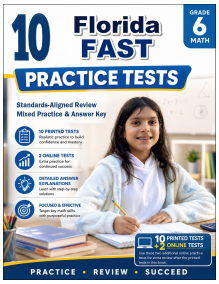

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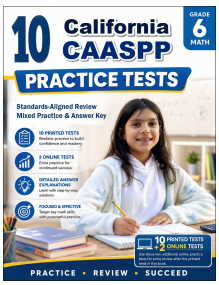

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