

Solutions

Accept equivalent correct methods and supported interpretations. The marks check reasoning; they are not an official grade.

2.1 A – All deviations from the shifted mean are unchanged. B treats a translation as added spread; C treats it as multiplication. Distances from the mean change in neither way.

Correct response linked to the given case.

2.2 A – $(2+2+2+6)/4=3$. B averages the distinct values without their frequencies; C adds those values without dividing by the observation count.

Correct response linked to the given case.

2.3 6 – Maximum minus minimum is $9-3$.

Correct response linked to the given case.

2.4 False – Centre and spread describe different features.

Correct response linked to the given case.

3.1 Data are 2,2,2,5,5,8. $\bar{x} = (3(2) + 2(5) + 1(8))/6 = 4$. Median is the average of positions 3 and 4, $(2 + 5)/2 = 3.5$. Range $R = 8 - 2 = 6$.

Sound conclusion or proposed method. Relevant supporting steps or textual evidence . Accurate conditions, checks or qualification.

3.2 Mean $\bar{z} = 3\bar{x} - 4 = 3(4) - 4 = 8$. Median is $3(3.5) - 4 = 6.5$. Range is $3(6) = 18$. Standard deviation triples; subtracting 4 changes no distance from the mean.

Sound conclusion or proposed method. Relevant supporting steps or textual evidence. Accurate conditions, checks or qualification.

3.3 Both means are 5. Every A observation is 5 from its mean; B distances are 5,0,0,5. B therefore has smaller mean squared deviation and smaller standard deviation. Equal range alone is insufficient.

Sound conclusion or proposed method. Relevant supporting steps or textual evidence. Accurate conditions, checks or qualification.