Sample standard deviation

6 questions | 13 marks

Equivalent correct methods earn the corresponding marks.

1. Find s for 1,3,5. [2 marks]

Mean 3; squared deviations sum 8; sample variance 8/2=4.

Answer: 2.

2. Find the sample variance and s for 3,3,7,7. [2 marks]

Mean 5; squared deviations 4+4+4+4=16.

Divide by 3, then take the square root.

Answer: Variance 16/3; s≈2.309.

3. A sample has s=5. Every value increases by 20. Find the new s. [2 marks]

Shifting does not change deviations from the mean.

Answer: 5.

4. A sample has s=3. Values are multiplied by−2. Find the new s. [2 marks]

Standard deviation scales by the absolute multiplier:|−2|×3=6.

Answer: 6.

5. A calculator returns Sx=4.20 and sigma-x=3.76 for a survey sample. Which should be reported as an estimate of population spread? [2 marks]

The survey observations are a sample, so use the n−1 calculation.

Answer: Sx=4.20, with the original unit.

6. For sample values 4,6,8,10, calculate the mean and s to 3 decimal places. [3 marks]

Squared deviations 9+1+1+9=20.

s=sqrt(20/3)≈2.581988897.

Answer: Mean 7; s≈2.582.