Worked answers | Statistics and data analysis

Comparing distributions

6 questions | 14 marks

Equivalent correct methods earn the corresponding marks.

1. Class A has mean 72, SD 6; class B has mean 72, SD 11. Compare. [2 marks]

Centres coincide.

6<11 compares SD.

Answer: Same mean; A's scores are less spread around the mean.

2. Bus A has median delay 5 min, IQR 2; Bus B median delay 3 min, IQR 6. State two differences. [3 marks]

3<5 for centre.

2<6 for central spread.

Answer: B has lower typical delay; A has more consistent middle-half delays.

3. One sample is in centimetres and another in metres. What must you do before comparing spreads? [2 marks]

The numerical scales differ.

Use one unit for centres and spreads.

Answer: Convert to a common unit.

4. A class has one unusually high score. Which is generally less affected: mean or median? Explain. [2 marks]

The median depends on ordered position.

An extreme value can substantially change the total used for the mean.

Answer: Median.

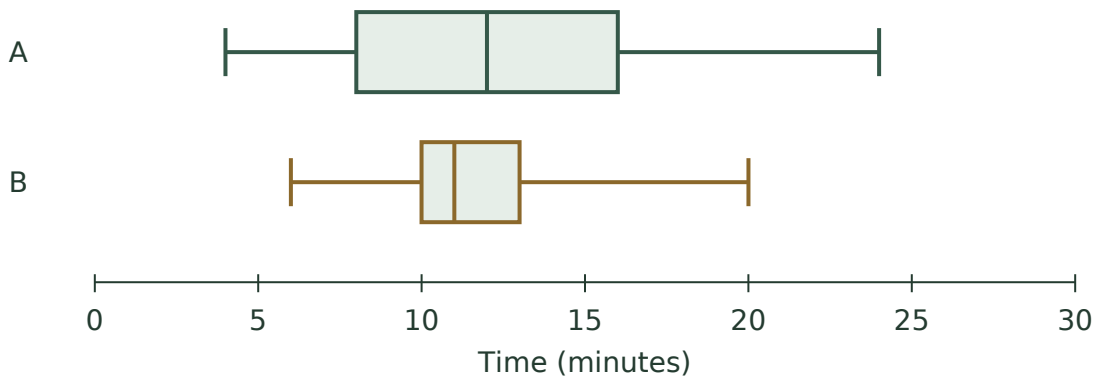
5. A sample of 10 volunteers has a lower median than a random sample of 200. Can you conclude its population median is lower? [2 marks]

The volunteer sample may be biased and is small.

The observations describe the samples; generalisations need more evidence.

Answer: Not from these facts alone.

6. Write a comparison using both plots. [3 marks]



Read medians and quartiles on the common scale.

Keep the conclusion within the sampled groups.

Answer: B has median 11 min rather than 12 min and IQR 3 min rather than 8 min; B is slightly quicker and more consistent in these samples.