Topic test | Statistics and data analysis

Statistics and data analysis - Applications test

Name: _____ Date: _____

16 questions | 46 marks | 60 minutes

Apply statistical tools to clinics, transport and school investigations; critique the limits of claims.

A scientific calculator may be used.

1. A clinic has recorded waits 8, 10, 12, 12, 13, 15, 18, 40 minutes. Calculate mean and median. [3 marks]

2. Which of those two summaries better describes the centre without the extreme wait dominating? Explain. [2 marks]

3. Give the clinic's five-number summary using median-of-halves, and its IQR. [4 marks]

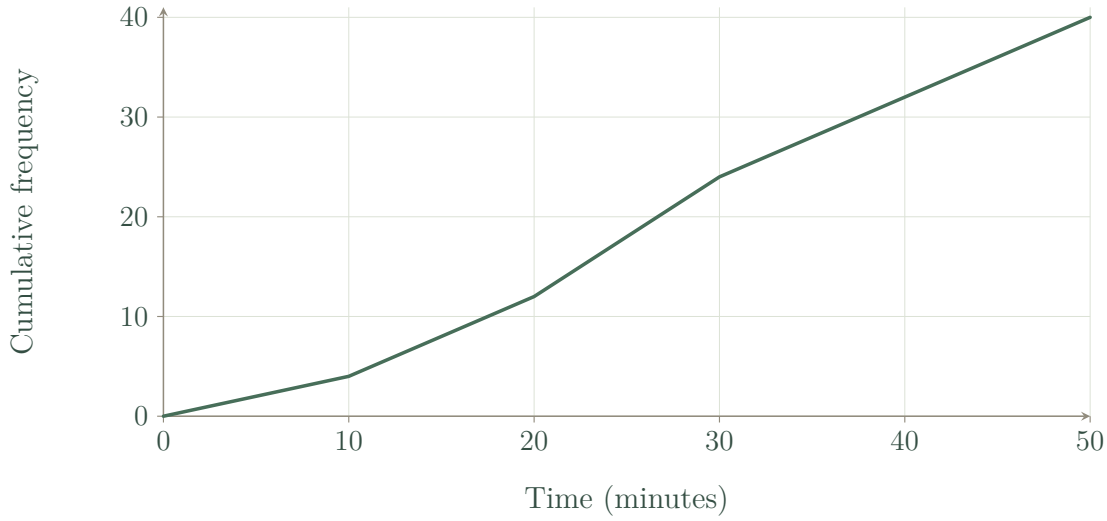
4. A second clinic has median 15 min and IQR 3 min. Compare the clinics without calling either universally better. [3 marks]

5. The clinic changes every wait by subtracting 3 minutes. State the new mean and what happens to SD. [2 marks]

6. A delivery firm has population mean 4 kg and variance 2.25 kg^2. Find its SD and interpret it. [3 marks]

7. A school reports an estimated mean journey time from grouped intervals. Why should it not claim the exact mean to six decimal places? [2 marks]

8. Forty race times have the supplied cumulative graph. Estimate P_{50} and P_{80}. [4 marks]



9. A team says '80% of future athletes will finish within 40 minutes'based only on that sample. Explain the overstatement. [2 marks]

10. In a study-time investigation, scores rise with reported study. Name two possible limitations. [3 marks]

11. The study contains pairs $(1, 45)$, $(2, 50)$, $(3, 58)$, $(4, 67)$, $(5, 72)$. Predicting a score at 3.5 hours is different from predicting at 20 hours. Explain. [3 marks]

12. A transport survey compares bus use: Year 9 24 of 40; Year 10 30 of 75. Compare fairly. [3 marks]

13. Of all 54 bus users in that survey, what percentage are Year 10? [2 marks]

14. A sponsor publishes only the best-performing subgroup after trying many groups. What concern does this raise? [3 marks]

15. A student's investigation excluded one outlier without checking it. Write a better procedure. [3 marks]

16. Write a complete short conclusion for a convenience sample showing a positive association between height and arm span, including two limitations. [4 marks]