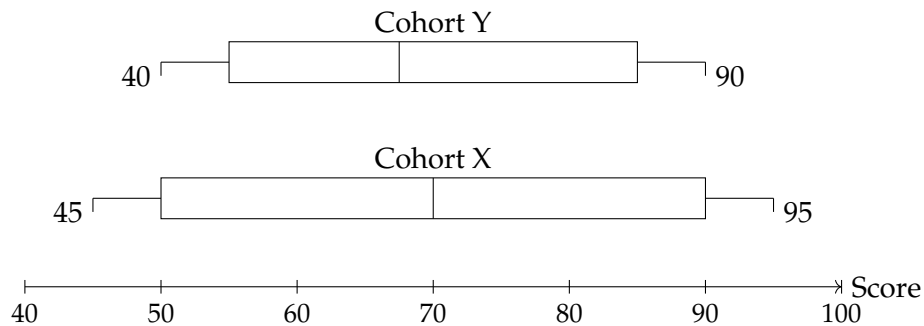


End of Topic Test – Chapter 1 (Test 2: Topics 4–6)

Answer all questions in the spaces provided.

1. Comparing distributions using box plots

The box plots below summarise the test scores (out of 100) for two cohorts, Cohort X and Cohort Y, who took the same exam.



- (a) (2 points) Which cohort has the higher median score?
- (b) (3 points) Which cohort shows greater variability? Explain your answer using features of the box plots.
- (c) (3 points) A school administrator claims Cohort X performed better overall because its maximum score is higher. Critically evaluate this claim.

2. Grouped data calculations

A traffic survey recorded vehicle speeds (km/h) on a suburban road. The grouped frequency table below summarises the results from a sample of 200 vehicles.

Speed interval (km/h)	Frequency	Midpoint
30–39	12	34.5
40–49	38	44.5
50–59	70	54.5
60–69	50	64.5
70–79	20	74.5

- (a) (4 points) Estimate the mean speed using the midpoints. Give your answer to one decimal place.
- (b) (4 points) Estimate the median speed. Show your working and give your answer to one decimal place.
- (c) (2 points) Suggest one limitation of using grouped data to estimate the mean and median.

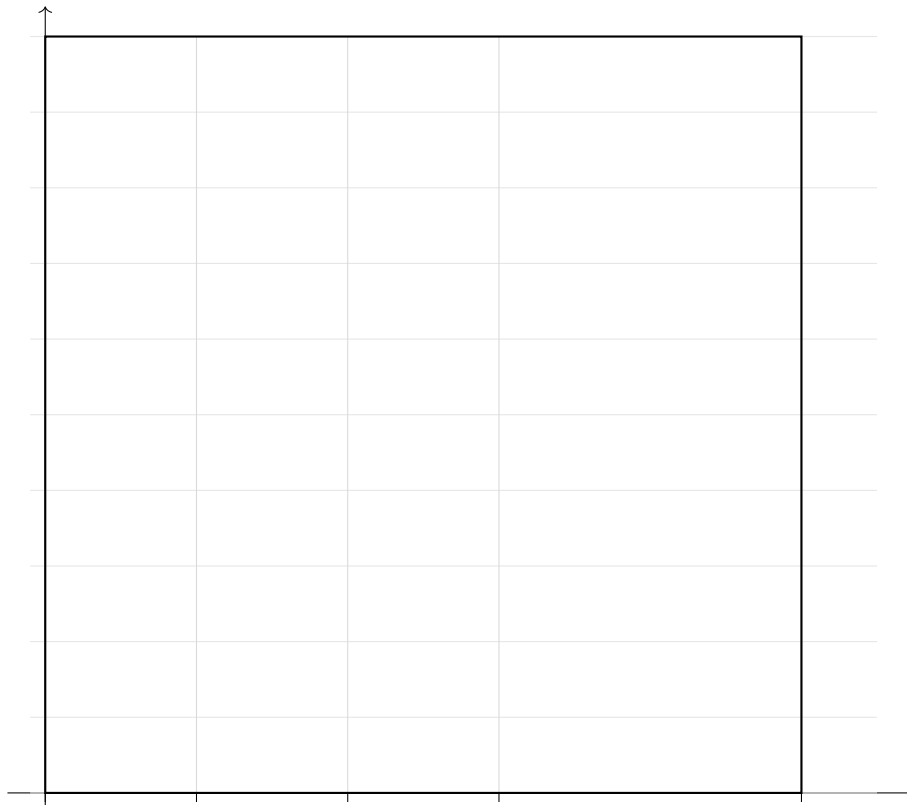
3. Histograms and frequency density

A wildlife survey recorded the lengths (cm) of a species of fish. The data were grouped into unequal class widths and summarised as follows:

Length interval (cm)	Frequency
10–14	8
14–18	22
18–22	40
22–30	30

(a) (3 points) Calculate the frequency density for each class and complete the table (show working).

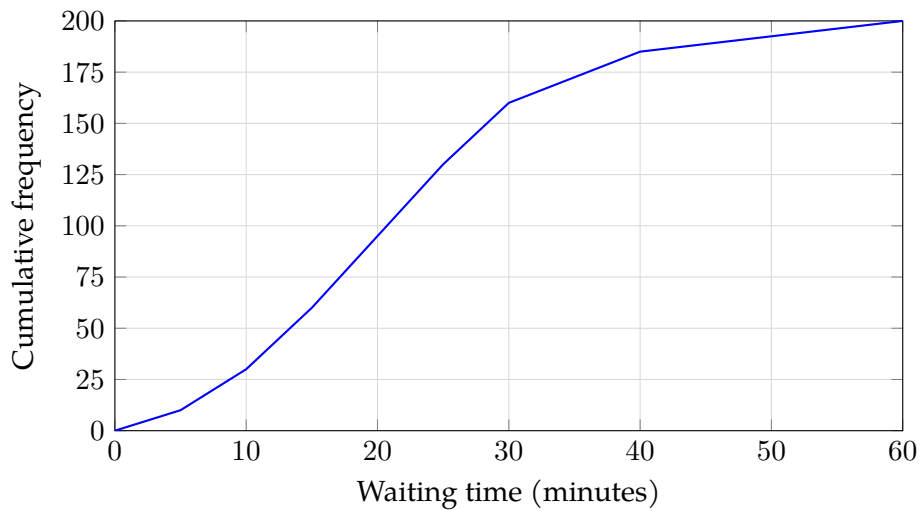
(b) (3 points) Sketch a labelled histogram using the class intervals and frequency densities (unequal widths).



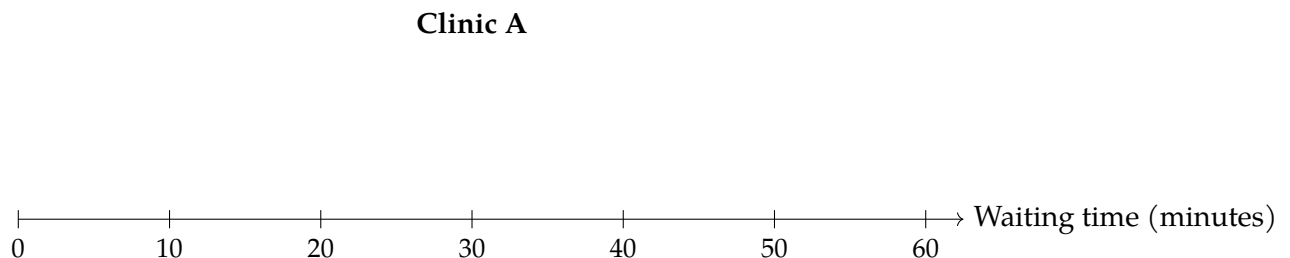
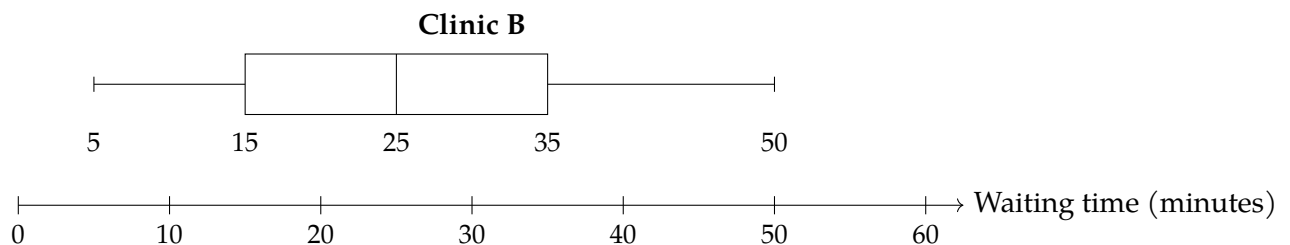
(c) (4 points) according to UK law. only fish that have a length of more than 19 cm can be caught for selling. it estimated that the population of fish in that area is around 1 million. estimate how many fish are suitable to catch and sell in this area.

4. Cumulative frequency and percentiles

The following cumulative frequency graph shows the distribution of waiting times (minutes) at clinic A.



- (a) (1 point) Use the graph to estimate the median waiting time.
- (b) (1 point) Estimate the 75th percentile waiting time.
- (c) (5 points) Clinic B waiting times distribution is shown in the box plot below . draw and box plot for clinic A to and compare the distributions.



5. Interpreting survey results

A local council published two surveys about satisfaction with public parks. Survey A used an online panel; Survey B used face-to-face interviews at park entrances. Both surveys asked the same five-point satisfaction question. Survey A reported 68% satisfied, while Survey B reported 54% satisfied.

- (c) (2 points) Suggest one change to the survey design that could make the results more comparable between the two methods.