

1 The table shows the distribution of the number of minutes spent on social media in an evening by a group of 200 students.

Time spent (minutes)	0–5	6–10	11–15	16–20	21–25	26–30
Frequency	12	28	46	54	38	22

- (i) Copy and complete a cumulative frequency table for this data.
- (ii) Draw a cumulative frequency graph on graph paper.
- (iii) Use your graph to estimate the median time.
- (iv) Use your graph to estimate the number of students who spent more than 18 minutes on social media.
- (v) On 90% of the evenings at most t minutes were spent on social media. Estimate the value of t .

2 The numbers of passengers on a certain tram at different times of the day are:

19, 7, 11, 23, 18, 32, 15,
26, 14, 29, 35, 21, 27, 16,
9, 24, 20, 22, 28, 12.

- (i) Draw an ordered stem-and-leaf diagram to represent this information.
- (ii) Find the median, the lower quartile, the upper quartile and the interquartile range.
- (iii) State which is more appropriate as a measure of central tendency for these data, the mean or the median, and give a reason for your answer.

3 The masses of 200 cartons of juice are summarised in the table.

Mass (grams)	<30	<40	<50	<60	<70	<80
Cumulative frequency	6	30	74	138	186	200

- (i) State in which mass interval the median lies.
- (ii) Find the smallest possible value and the largest possible value of the interquartile range.
- (iii) Find how many cartons weighed between 40 g and 70 g.
- (iv) Draw a histogram to represent the distribution of the masses of the cartons.

4 Two classes, A and B, were asked how many minutes they usually take to travel to school. The summary statistics are:

	Minimum	Lower quartile	Median	Upper quartile	Maximum
Class A	8	14	18	25	40
Class B	6	10	16	22	32

- (i) On the same horizontal scale, draw box-and-whisker plots for the two classes.
(ii) Compare the travel times of the two classes, commenting on both their typical values and their spread.

5 The times, in seconds, taken by 8 athletes to run a short race are:

11.8, 12.3, 11.5, 12.9, 11.7, 12.1, 11.6, 12.4.

- (i) Calculate the mean time.
(ii) Calculate the standard deviation of the times.
(iii) One more athlete runs the race in 11.2 seconds. Without full recalculation, explain clearly what effect this new time will have on
(a) the mean,
(b) the standard deviation.

6 The marks x of 20 students in a statistics test are coded using

$$y = x - 50.$$

It is given that

$$\sum y = 40 \quad \text{and} \quad \sum y^2 = 960.$$

- (i) Find the mean and standard deviation of the coded marks y .
(ii) Hence find the mean and standard deviation of the original marks x .