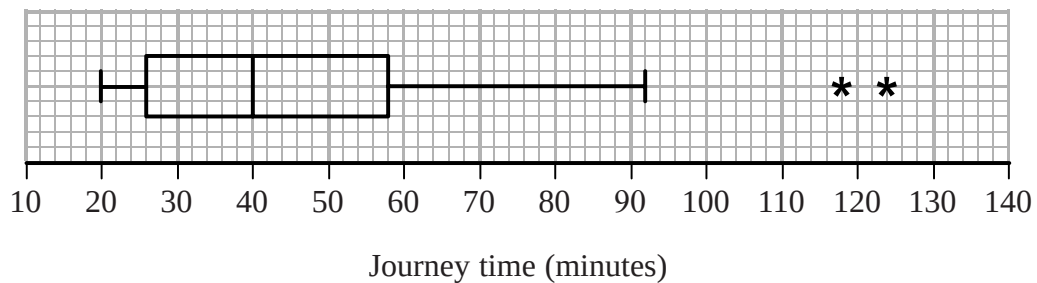


4. Charlie is studying the time it takes members of his company to travel to the office. He stands by the door to the office from 0840 to 0850 one morning and asks workers, as they arrive, how long their journey was.
- (a) State the sampling method Charlie used. (1)
- (b) State and briefly describe an alternative method of non-random sampling Charlie could have used to obtain a sample of 40 workers. (2)

Taruni decided to ask every member of the company the time, x minutes, it takes them to travel to the office.

- (c) State the data selection process Taruni used. (1)

Taruni's results are summarised by the box plot and summary statistics below.



$$n = 95 \quad \sum x = 4133 \quad \sum x^2 = 202\,294$$

- (d) Write down the interquartile range for these data. (1)
- (e) Calculate the mean and the standard deviation for these data. (3)
- (f) State, giving a reason, whether you would recommend using the mean and standard deviation or the median and interquartile range to describe these data. (2)

Rana and David both work for the company and have both moved house since Taruni collected her data.

Rana's journey to work has changed from 75 minutes to 35 minutes and David's journey to work has changed from 60 minutes to 33 minutes.

Taruni drew her box plot again and only had to change two values.

- (g) Explain which two values Taruni must have changed and whether each of these values has increased or decreased. (3)