

Chapter 1 Investigating data distributions: Assignment

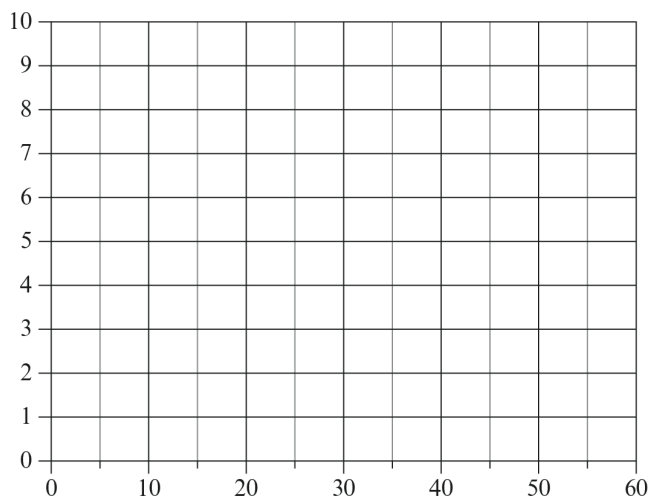
Student name: _____

- 1 The table below gives the distribution of waiting times of 39 cars at a set of traffic lights on a major road on a Sunday afternoon.

<i>Time spent waiting (seconds)</i>	Frequency	Percentage
0–4	1	2.6
5–9	3	7.7
10–14	2	5.1
15–19	2	5.1
20–24	3	7.7
25–29	6	15.4
30–34		20.5
35–39	9	
40–44	4	10.3
45–49	0	0
50–54	0	0
55–59	1	2.6
Total	39	100.1

- a Complete the table by filling in the blank spaces.
- b Determine:
- the number of cars that waited at the lights for less than 25 seconds
 - the percentage of cars that waited at the lights for 40 seconds or more
- c Use the grid below to construct a frequency histogram to display the distribution of waiting times. Label your axes appropriately.

Chapter 1 Investigating data distributions: Assignment



d

- i** Use your histogram to help you describe the shape of the distribution of waiting times.
- ii** We wish to calculate a measure of centre to enable us to estimate the typical waiting times of cars stopping at these traffic lights on a Sunday. Given the shape of the distribution of waiting times, which measure of centre is most appropriate to use and what is its approximate value?

- 2** The following table gives the life expectancies in years for females from 28 countries around the world.

62.3	78.7	76.0	71.5	58.6	80.8	71.3	47.5	81.4	80.7	54.1	82.0	82.8	50.5
43.2	81.9	75.7	72.1	78.7	72.0	78.3	69.1	53.4	81.2	80.7	81.6	82.0	84.1

- a** Use your calculator to construct a histogram of the female life expectancies, with a starting point of 40 and an interval width of 5. Use the histogram on your calculator to answer the following questions.
 - i** What is the shape of the histogram?
 - ii** How many countries have female life expectancies of less than 60 years?
 - iii** How many countries have female life expectancies of less than 70 years?
 - iv** How many countries have female life expectancies of 80 years or more?

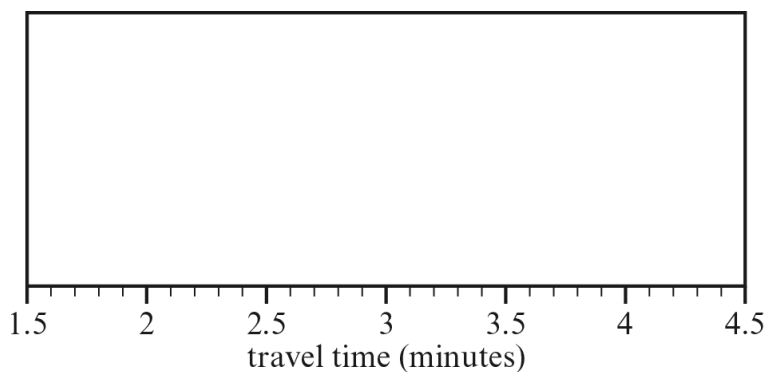
Chapter 1 Investigating data distributions: Assignment

- b** Use your calculator to help you complete the following statements by calculating the appropriate statistics:
- The mean life expectancy for females is _____ and the standard deviation of life expectancies is _____.
 - 50% of these countries have female life expectancies less than or equal to _____.
 - The range of female life expectancies was _____.
 - 25% of these countries recorded female life expectancies less than _____.
 - 25% of these countries recorded female life expectancies greater than _____.
 - The interquartile range for female life expectancies is _____.
 - To be an outlier a country would need to have a female life expectancy of less than _____ or more than _____.

- 3** Of the 39 cars that stopped at a set of traffic lights, 15 continued along the road until they reached the next set of traffic lights, two kilometres down the road. The five number summary for their travelling times is:

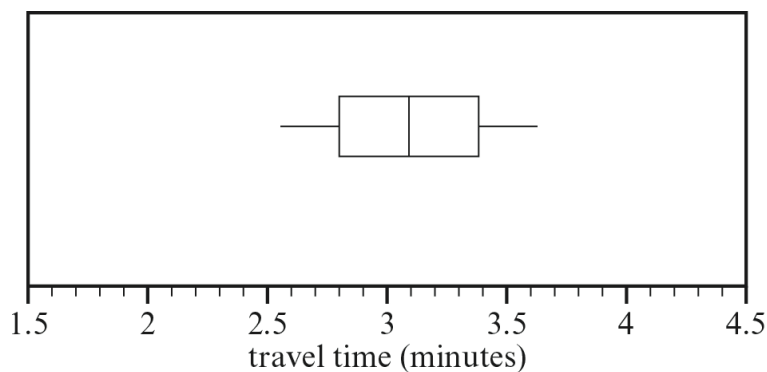
Min. = 1.7, $Q1 = 2.0$ $M = 2.6$ $Q3 = 3.1$ Max. = 3.4

- a** Use the five-number summary to construct a box plot in the space provided below.



- b** All the cars observed returned back along the road at some time later in the day and their travel times between the two sets of traffic lights were recorded on the return journey. The data is displayed in the form of a box plot, as shown below. Use this box plot to determine the *median* and *IQR* of the travel times of the cars on the return journey

Chapter 1 Investigating data distributions: Assignment



- 4 The distribution of travel times on this section of road at peak times is known to be approximately normal with a mean of 3.8 minutes and a standard deviation of 0.4 minutes.
- a Use this information to estimate the percentage of cars whose travelling times are:
- between 3.0 and 4.6 minutes
 - less than 3.4 minutes
 - between 3.0 and 4.2 minutes
- b A car has a travel time of 5 minutes.
- Determine the standardised travel time (z -score) of this car.
 - What percentage of cars have travel times less than this car?
- c A car has a standardised travel time of $z = 1.8$. What was its actual travel time? Give your answer rounded to one decimal place.