

EXERCISE 18D.1

- 1 For each of the following data sets, find:
- the median (make sure the data is ordered)
 - the upper and lower quartiles
 - the range
 - the interquartile range.

- a 2, 3, 3, 3, 4, 4, 4, 5, 5, 5, 5, 6, 6, 6, 6, 6, 7, 7, 8, 8, 8, 9, 9
 b 10, 12, 15, 12, 24, 18, 19, 18, 18, 15, 16, 20, 21, 17, 18, 16, 22, 14
 c 21.8, 22.4, 23.5, 23.5, 24.6, 24.9, 25, 25.3, 26.1, 26.4, 29.5
 d 127, 123, 115, 105, 145, 133, 142, 115, 135, 148, 129, 127, 103, 130, 146, 140, 125, 124, 119, 128, 141

Small sample, rounded continuous data, can often be treated in the same way as discrete data for the purpose of analysis.



- 2 The time spent (in minutes) by 20 people in a queue at a bank waiting to be attended by a teller, has been recorded as follows:

3.4 2.1 3.8 2.2 4.5 1.4 0
 0 1.6 4.8 1.5 1.9 0 3.6
 5.2 2.7 3.0 0.8 3.8 5.2

- a Find the median waiting time and the upper and lower quartiles.
 b Find the range and interquartile range of the waiting time.
 c Copy and complete the following statements:
- "50% of the waiting times were greater than minutes."
 - "75% of the waiting times were less than minutes."
 - "The minimum waiting time was minutes and the maximum waiting time was minutes. The waiting times were spread over minutes."



- 3
- | Stem | Leaf | For the data set given, find: | | | |
|------|-----------------------|-------------------------------|----------------------|--|--|
| 0 | 3 4 7 9 | a the minimum value | b the maximum value | | |
| 1 | 0 3 4 6 7 8 | c the median | d the lower quartile | | |
| 2 | 0 0 3 5 6 9 9 9 | e the upper quartile | f the range | | |
| 3 | 1 3 7 8 | g the interquartile range. | | | |
| 4 | 2 3 7 means 37 | | | | |

- 4 The heights of 20 six-year-olds are recorded in the following stem-and-leaf plot:

- a Find:
- the median height
 - the upper and lower quartiles of the data.
- b Copy and complete the following statements:
- "Half of the children are no more than cm tall."
 - "75% of the children are no more thancm tall."

Stem	Leaf
10	9
11	1 3 4 4 8 9
12	2 2 4 4 6 8 9 9
13	1 2 5 8 8
10 9	reads 109 cm

a The ordered data set is

1 2 3 3 3 4 4 5 5 5 5 6 7 7 8 9 (16 of them)

$Q_1 = 3$

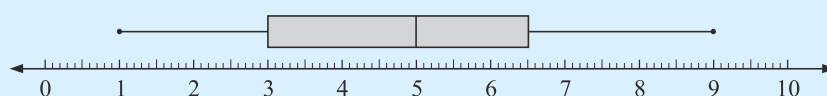
median = 5

$Q_3 = 6.5$

So the **5-number summary** is:

$$\begin{cases} \text{min. value} = 1 & Q_1 = 3 \\ \text{median} = 5 & Q_3 = 6.5 \\ \text{max. value} = 9 \end{cases}$$

b



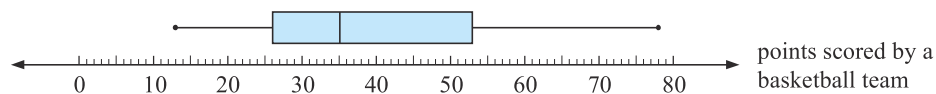
c i range = max. value – min. value
 $= 9 - 1$
 $= 8$

ii IQR = $Q_3 - Q_1$
 $= 6.5 - 3$
 $= 3.5$

d 75% of the data values are above 3.

EXERCISE 18D.2

1



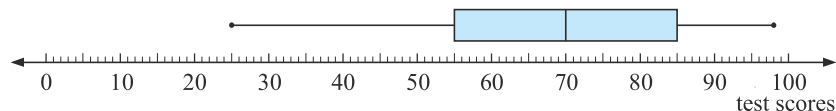
a The boxplot given summarises the goals scored by a basketball team. Locate:

i the median **ii** the maximum value **iii** the minimum value

iv the upper quartile **v** the lower quartile

b Calculate: **i** the range **ii** the interquartile range

2



The boxplot shown summarises the results of a test (out of 100 marks). Copy and complete the following statements about the test results:

- The highest mark scored for the test was
- The lowest mark scored for the test was
- Half of the class scored a mark greater than or equal to
- The top 25% of the class scored at least marks for the test.
- The middle half of the class had scores between and for this test.
- Find the range of the data set.
- Find the interquartile range of the data set.