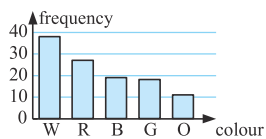
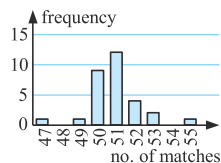


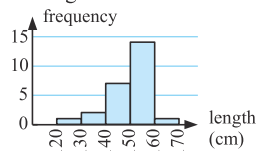
3 a column graph



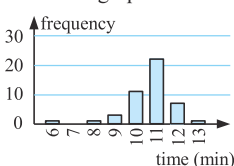
b column graph



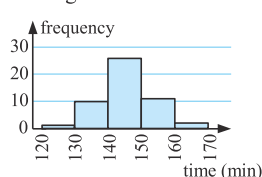
c histogram



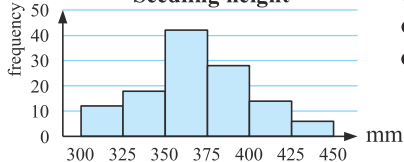
d column graph



e histogram



4 a Seedling height



b 20

c 58.33%

d i 1218
ii 5125 a 140 b 65 c $\div 53.6\%$

EXERCISE 18B.1

1 a i 5.61 ii 6 iii 6 b i 16.3 ii 17 iii 18

c i 24.8 ii 24.9 iii 23.5

d i 128.6 ii 128 iii 115 and 127

2 a A : 6.46 B : 6.85 b A : 7 B : 7

c The data sets are the same except for the last value, and the last value of A is less than the last value of B, so the mean of A is less than the mean of B.

d The middle value of the data sets is the same, so the median is the same.

3 a mean: \$29 300, median: \$23 500, mode: \$23 000

b The mode is the lowest value, so does not take the higher values into account.

c No, since the data is positively skewed, the median is not in the centre.

4 a mean: 3.3, median: 0, mode: 0

b The data is very positively skewed so the median is not in the centre.

c The mode is the lowest value so does not take the higher values into account.

d yes, 21 and 42 e no

5 a 44 b 44 c 40.2 d increase mean to 40.3 6 116

7 3144 km 8 \$185 604 9 $x = 15$ 10 $a = 5$ 11 37

12 a 1280 km b 516 km c 224.5 km 13 14.77

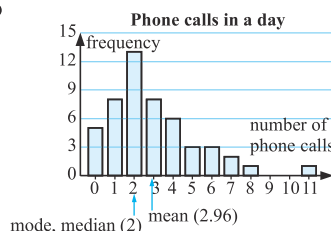
14 27.3 15 9 and 7

EXERCISE 18B.2

1 a 1 b 1 c 1.43

2 a i 2.96 ii 2 iii 2

b



c positively skewed with data value 11 as an outlier

d The mean takes into account the larger numbers of phone calls.

e the mean

3 a

Donation	Frequency
1	7
2	9
3	2
4	4
5	8

b 30

c i \$2.90

ii \$2

iii \$2

d the mode

4 a i 49 ii 49 iii 49.03 b no

c The sample of only 30 is not large enough. The company could have won its case by arguing that a larger sample would have found an average of 50 matches per box.

5 a i 2.61 ii 2 iii 2 b This school has more children per family than the average Australian family.

c positive

d The mean is larger than the median and the mode.

6 a i 69.1 ii 67 iii 73 b i 5.86 ii 5.8 iii 6.7

7 a i 5.63 ii 6 iii 6 b i 6.79 ii 7 iii 7

c the mean d yes

8 Team A: 91.25, Team B: 91.75, \therefore Team B

9 a 49 b 144 and 147 (bi-modal) c 25

10 a 29 b 107 c 149.5

11 a 0 b 1.7 c 1.5 12 $\div 81.2$ mm

13 a mean = \$163 770, median = \$147 200 (differ by \$16 570)

b i mean selling price ii median selling price

14 mean $\div 34.6$, mode = 35, median = 35 15 $\div 17.7$ 16 a $\div 70.9$ g b $\div 210.1$ g c 139.25 g 17 10.1 cm

18 17.25 goals per game 19 6 and 12

20 a mean for A $\div 50.8$, mean for B $\div 49.9$

b No, as to the nearest match, A is 51 and B is 50.

21 For X, mean $\div 399$ g. For Y, mean $\div 402$ g

The magazine will recommend Y.

22 a i \$31 500 ii \$28 000 iii \$33 300

b The mean as it is the highest measure.

EXERCISE 18B.3

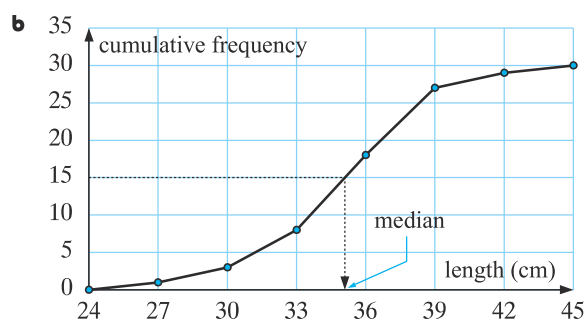
1 a $\bar{x} \div 13.5$ b $\bar{x} \div 50.5$ 2 31.73 a $\div 13.6$ goals b i 13.5 goals ii 13.6 goalsc The approximations are about the same. 4 $\div 495$ mm5 a 70 b $\div 411\,000$ litres, i.e., $\div 411$ kL c $\div 5870$ L6 a 125 people b $\div 119$ people c $\frac{3}{25}$ d 137 marks7 a 95 b 59.6 kg c 25 d 36.8% e $\frac{9}{19}$ or 47.4%

EXERCISE 18C

1 a 2 b 8 2 1 error

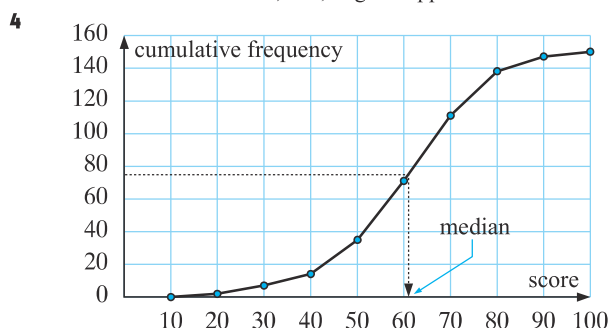
3 a

Length (x cm)	Frequency	C. frequency
$24 \leq x < 27$	1	1
$27 \leq x < 30$	2	3
$30 \leq x < 33$	5	8
$33 \leq x < 36$	10	18
$36 \leq x < 39$	9	27
$39 \leq x < 42$	2	29
$42 \leq x < 45$	1	30



c median \div 35 cm

d actual median = 34.5, i.e., a good approximation



a \div 61 students **b** \div 91 students **c** \div 76 students

d 24 (or 25) students **e** 76 marks

5 a 8 **b i** 40 **ii** 40

6 a 28.8 min **b** 35 **c** 26.5 min

7 a 26 years **b** 41.5% **c i** 0.556 **ii** 0.0287

8 a 2270 h **b** 69.3% **c** 62 or 63 **d** 0.0854

9 a 47.8 m **b** 12 or 13 **c** 50 or 51 **d** 35 **e** 0.0733

EXERCISE 18D.1

1 a i 6 **ii** $Q_1 = 4$, $Q_3 = 7$ **iii** 7 **iv** 3
b i 17.5 **ii** $Q_1 = 15$, $Q_3 = 19$ **iii** 14 **iv** 4
c i 24.9 **ii** $Q_1 = 23.5$, $Q_3 = 26.1$ **iii** 7.7 **iv** 2.6
d i 128 **ii** $Q_1 = 121$, $Q_3 = 140.5$ **iii** 45 **iv** 19.5

2 a median = 2.45, $Q_1 = 1.45$, $Q_3 = 3.8$

b range = 5.2, IQR = 2.35

c i greater than 2.45 min **ii** less than 3.8 min
iii The minimum waiting time was 0 minutes and the maximum waiting time was 5.2 minutes. The waiting times were spread over 5.2 minutes.

3 a 3 **b** 42 **c** 20 **d** 13 **e** 29 **f** 39 **g** 16

4 a i 124 cm **ii** $Q_1 = 116$ cm, $Q_3 = 130$ cm

b i 124 cm **ii** 130 cm tall

c i 29 cm **ii** 14 cm **d** over 14 cm

5 a i 7 **ii** 6 **iii** 5 **iv** 6.5 **v** 1.5

b i 10 **ii** 7 **iii** 6 **iv** 8 **v** 2

EXERCISE 18D.2

1 a i 35 **ii** 78 **iii** 13 **iv** 53 **v** 26 **b i** 65 **ii** 27

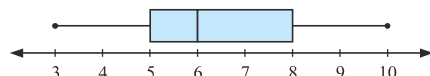
2 a was 98 **b** was 25

c greater than or equal to 70 **d** at least 85 marks

e between 55 and 85 **f** 73 **g** 30

3 a i min = 3, $Q_1 = 5$, median = 6, $Q_3 = 8$, max = 10

ii



iii range = 7 **iv** IQR = 3

b i min = 0, $Q_1 = 4$, median = 7, $Q_3 = 8$, max = 9

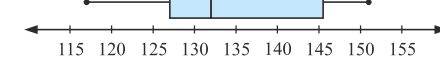
ii



iii range = 9 **iv** IQR = 4

c i min = 117, $Q_1 = 127$, median = 132, $Q_3 = 145.5$, max = 151

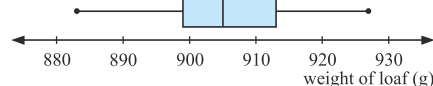
ii



iii range = 34 **iv** IQR = 18.5

4 a median = 905 g, $Q_1 = 899$ g, $Q_3 = 913$ g, max weight = 927 g, min weight = 883 g

b



c i IQR = 14 g **ii** range = 44 g

d i at least 905 g **ii** 25% of the loaves

iii spread over 14 g

iv a weight of 899 g or less

e a little negatively skewed

5 a

Statistic	Year 9	Year 12
min value	1	6
Q_1	5	10
median	7.5	14
Q_3	10	16
max value	12	17.5

b i Year 9: 11, Year 12: 11.5

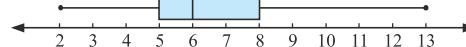
ii Year 9: 5, Year 12: 6

c i true

ii true

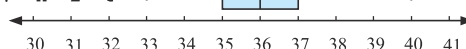
6 a median = 6, $Q_1 = 5$, $Q_3 = 8$ **b** 3

c



7 a $\text{Min}_x = 33$, $Q_1 = 35$, $Q_2 = 36$, $Q_3 = 37$, $\text{Max}_x = 40$

b i 7 **ii** 2 **c**



8 a 10 **b** \div 28.3% **c** 7 cm **d** IQR \div 2.6 cm

e 10 cm, which means that 90% of the seedlings have a height of 10 cm or less.

9 a 27 min **b** 29 min **c** $31\frac{1}{2}$ min **d** IQR \div $4\frac{1}{2}$ min

e 28 min 10 sec

10 a 480 **b** 120 marks **c** 84 **d** IQR \div 28 **e** 107 marks

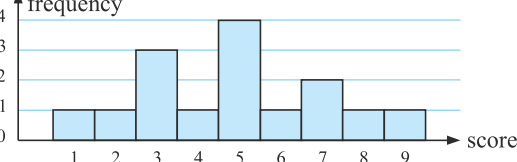
EXERCISE 18E.1

1 a $\bar{x} \div 4.87$, $\text{Min}_x = 1$, $Q_1 = 3$, $Q_2 = 5$, $Q_3 = 7$, $\text{Max}_x = 9$

b



c



d $\bar{x} \div 5.24$, $\text{Min}_x = 2$, $Q_1 = 4$, $Q_2 = 5$, $Q_3 = 6.5$, $\text{Max}_x = 9$

set 1

set 2

