

Chapter 7

Exercise 7A [s.d. to 1dp]

- 1 a 8, 2.6
b 19, 3.1
c 11, 2.6
d 34.5, 10.1
- 2 a 24, 8.7
b 22, 14.7
c 1.94, 0.2
- 3 a (i) £33
(ii) £9.21
b (i) £34.50
(ii) £9.21
- 4 a (i) £28000
(ii) £10124.20 [rounded from 10124.2283657]
b (i) £30000
(ii) £10124.20 [rounded from 10124.2283657]
- 5 a 0, 2.6
b 2, 2.8
c Average temp higher in London, but wider variation in London.
- 6 a 27, 10.7
b 9, 3.5
c Men have fewer shoes. Variation much higher in women group.
- 7 a 9 mins, 2.9mins
b 22mins, 13.9mins
c Fast food much quicker and much less variation.
- 8 a 118kg, 18kg
b 99kg, 6kg
c Males heavier and greater variation.
d Yang Guang much heavier than average, TianTian about average.
- 9 a 17mm, 9.7mm
b 12mm, 5.7mm
c Dorset wetter with greater variation.
- 10 a 100, 2
b Not quite: s.d. = 2 but claim is < 2.

- 11 a 76, 2.8
b 76, 5
c Average is identical but Gordon has higher variation [less consistent].

Exercise 7B

- 1 a 6, 3, 6, 8, 5
b 38.5, 29, 38.5, 46.5, 17.5
c 5.3, 2.95, 5.3, 7.8, 4.85
- 2 measurements in cm
a (i) 135
(ii) 124, 135, 165
(iii) 41
b (i) 42
(ii) 38, 42, 52
(iii) 14
c Indian ears very much smaller and less variation.
- 3 measurements in £
a (i) 149000
(ii) 128000, 149000, 163000
(iii) 35000
b (i) 118000
(ii) 99000, 118000, 136000
(iii) 37000
c Glasgow generally cheaper by about 30 000, and slightly greater variation.
- 4 a (i) 28
(ii) 24, 28, 34
(iii) 10
b (i) 32
(ii) 27, 32, 38
(iii) 11
c After training: increased average and similar variation.
- 5 a (i) 18.5
(ii) 17, 18.5, 20
(iii) 3
b (i) 8.5
(ii) 6, 8.5, 13
(iii) 7
c fewer in November, greater variation.
d In November close several rooms, reduce costs.

- 6 a (i) 84.4
 (ii) 74.5, 84.4, 91.7
 (iii) 17.2
 b (i) 85.2
 (ii) 75.1, 85.2, 92.6
 (iii) 17.5
 c Mexican average slightly higher and slightly greater variation.

7 Measurements in £

- a (i) 2631
 (ii) 2286, 2631, 2880
 (iii) 594
 b Georgia median is cheaper but has greater variation.

- 8 a (i) 60
 (ii) 33, 60, 76.5
 (iii) 43.5

- b (i) 88
 (ii) 43.5

- c (i) 100, 45
 (ii) Range much more affected than IQR.

- 9 a (i) 9701.5
 (ii) 8928.5, 9701.5, 10730.5
 (iii) 901

- b (i) 10587
 (ii) 10125, 10587, 11595.5
 (iii) 735.25

- c Sport is more popular; higher average and less variation.

10 Calculations/measurements in Euros.

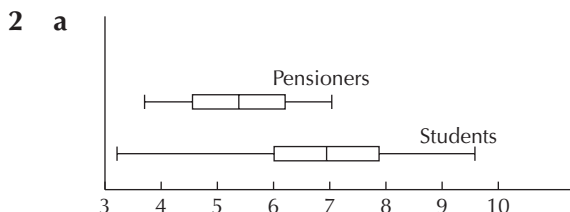
- a (i) 2.1
 (ii) 1.825, 2.1, 2.65
 (iii) 0.4125

- b (i) 1.9
 (ii) 1.75, 1.9, 2
 (iii) 0.125

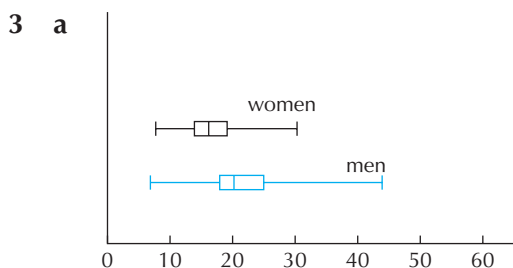
- c Cheaper in Spain and much less variation.

Exercise 7C

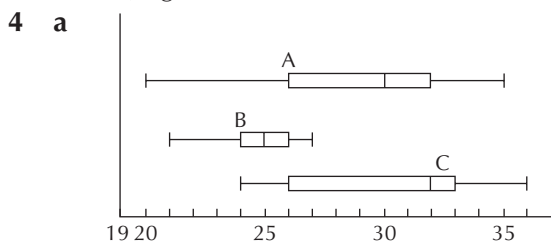
- 1 a low = 3, Q1 = 8, Q2 = 12, Q3 = 16.5, median = 12, high = 21, IQR = 8.5
 b low = 15, Q1 = 19, Q2 = 23, Q3 = 27, median = 23, high = 33, IQR = 8
 c low = 21, Q1 = 25, Q2 = 28, Q3 = 33, median = 28, high = 38, IQR = 8
 d low = 101, Q1 = 105, Q2 = 111.5, Q3 = 118, median = 111.5, high = 123, IQR = 13



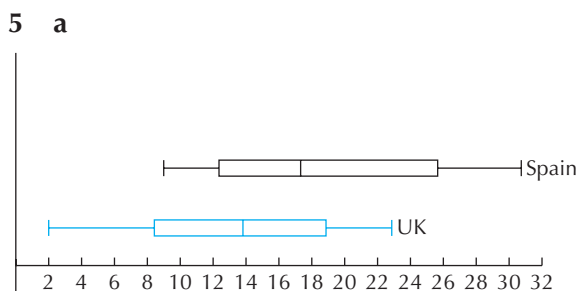
- b Much wider range in students. On average pensioners better.



- b Men wider range and on average higher. IQR greater.



- b C most effective. C has greater IQR and much higher median.



- b** Spanish temperatures are generally higher, greater IQR.
- 6 a** Friday lowest = 27, $Q1 = 36$, $Q2 = 46$, $Q3 = 51$, highest = 61
Saturday lowest = 21, $Q1 = 29$, $Q2 = 43$, $Q3 = 60$, highest = 78, SIQR = 15.5
- b** 7.5, 15.5
- c** Median Friday time was slightly higher. Saturday SIQR greater.
- 7** Although Dr Ball has a higher median waiting time (7 mins vs 5 mins), there are much less extremes. Dr Ball is best as you are never waiting longer than 10 minutes.
- 8** Town A has greater extremes in temp but median is much lower. Town B better for holiday.
- 9 a** Race 1 lowest = 20, $Q1 = 28$, $Q2 = 38$, $Q3 = 52$, high = 70
Race 2 lowest = 24, $Q1 = 32$, $Q2 = 38$, $Q3 = 44$, high = 58
- b** 24, 12
- c** Race 1 is 10k; unlikely to have older runners on longer race.
- d** Median is same, IQR much larger for R1.
- 10 a** USA median = 26, SIQR = 12
Italy median = 22, SIQR = 8
- b** Italy has less variation.
- 11** Dasa is fastest, Chiara second fastest based on median. Extreme times are unreliable guide.
- 12** Median temp for Bude is higher. Bude has greater extremes. SIQR for Toruay is slightly larger.

Exercise 7D

- 1 a** (i) 927575, 658054
(ii) 764895, 794582
- b** (i) 2567764.1, 4380913.8
(ii) 900870, 1734878
- c** (i) greatly increased
(ii) median similar, IQR ~ doubled
(iii) standard deviation.

- 2 a** (i) £34000
(ii) £28000
(iii) £20000
(iv) £24233.24
(v) £29 500
- b** (i) £36040
(ii) £29680
(iii) £21200
(iv) £25687.24
(v) £31270
- c** (i) £35500
(ii) £29500
(iii) £21500
(iv) £24233.24
(v) £29500
- d** (i) 6%
(ii) 6%
- e** median, IQR
- f** Less money for him personally.
- 3 a** Key: Steve, Alison, Albert, Brian
Charlton: David, Pete, Julie, Hannah
- b** Key: 7.94
Charlton: 10.31
Keyteam has less variation.
- c** Key: Alison, Ann, Holly, Brian
Charlton: Hannah, Pete, Barbara, Julie
- d** Slightly different, chosen outliers.
- e** Key: 31
Charlton: 25.5
- f** Key prefer mean, greater total weight.
Charlton prefer median.
- 4 a** (i) P1: mean = 62, sd = 15.48
P2: mean = 63, sd = 12.79
(ii) Papers similar mean, slightly higher variation in P1.
(iii) 4, 4

- b** (i) P1: median = 61.5, IQR = 16
P2: median = 61.5, IQR = 19
(ii) Same median, larger quartile spread in P2.
(iii) Paper 1 - 5; Paper 2 - 5
- c** Median and IQR; results closest.
- d** P1 shows lowest spread for IQR. P2 shows lowest spread for sd.
- 5 a** tango = 6.8, Salsa = 6.2, Ballroom = 6.4. Salsa lowest so Kath correct.
- b** Tango = 6, Salsa = 6, Ball = 8. Kath not correct.
- c** Tango = 2.28, Salsa = 2.05, Ballroom = 2.19. Salsa has most consistent marks.
- d** Not enough data to provide good spread.

Activity measurements in cm

- 1** Height: mean = 168, Median = 169, sd = 7.32, IQR = 11
hand: mean = 19.84, median = 19.85, sd = 1.58, IQR = 3
shoe: mean = 9.7, median = 9.5, sd = 1.34, IQR = 2
arm: mean = 157.9, median = 158, sd = 7.58, IQR = 13
- 2** Exercise for student
- 3** Exercise for student
- 4** Exercise for student.