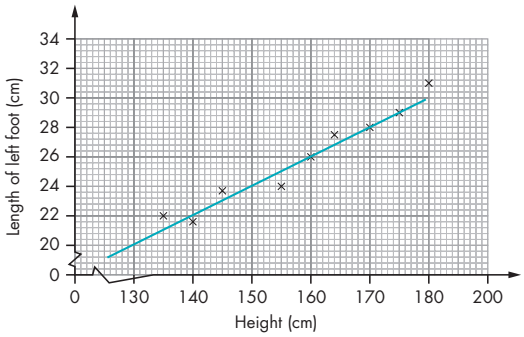
8 **a, b** any reasonable best-fitting line



c 24.2 cm (answers may vary depending on best-fitting line drawn)

Chapter 25 Selecting and using appropriate numerical notation and units

Exercise 25A Order of operations and inequalities

1 **a** 19 **b** 16 **c** 8 **d** 6
e 6 **f** 12 **g** 11 **h** 2
i 6 **j** 20 **k** 13 **l** 13

2 **a** 18 **b** 2 **c** 2 **d** 9
e 9 **f** 13 **g** 4 **h** 20
i 15 **j** 4 **k** 2 **l** 5

3 **a** $4 \times (5 - 1)$ **b** $8 \div 2 + 4$
c $(8 - 3) \times 4$ **d** $12 - 5 \times 2$
e $3 \times (3 + 2)$ **f** $12 \div (2 + 1)$
g $9 \times 6 \div 3$ **h** $20 - (8 + 5)$
i $(6 + 4) \div 2$ **j** $16 \div (4 \div 2)$
k $20 \div 2 + 2$ **l** $5 \times 3 - 5$

4 No; $8 - 3 \times 2 = 8 - 6 = 2$.

5 Amanda did the addition first: $(3 + 4) \times 5 = 35$; Andrew did the multiplication first: $3 + (4 \times 5) = 23$.

Andrew is correct.

6 $(2 + 5) \times 6 = 42$

7 **a** < **b** > **c** < **d** <

8 **a** 7, 8, 9 **b** 5, 6, 7 **c** 1, 2, 3
d 1, 2, 3 **e** 5, 6, 7 **f** –1, 0, 1

Exercise 25B Units of measurement

1 **a** centimetres
b kilometres or metres
c millimetres
d kilograms
e litres
f grams
g metres
h grams
i °C
j kilometres

2 Answers will vary.

3 The metre is too small a unit. This distance is an approximation and is also a large distance, so the unit needs to be a large one.

4 4 metres, as this is long enough to reach the windows but short enough to handle more easily. 2 metres is too short, and 6 metres is too long.

Chapter 26 Selecting and carrying out calculations

Exercise 26A Rounding, significant figures and estimating

1 **a** 3.7 **b** 8.7 **c** 5.3 **d** 18.8
e 0.4 **f** 26.3 **g** 3.8 **h** 10.1
i 11.1 **j** 12.0

2 **a** 6.72 **b** 4.46 **c** 1.97 **d** 3.49
e 5.81 **f** 2.56 **g** 21.80 **h** 12.99
i 2.30 **j** 5.56

3 **a** 7 **b** 9 **c** 3 **d** 8
e 8 **f** 3 **g** 2 **h** 2
i 5 **j** 4

4 **a** 50 000 **b** 60 000 **c** 30 000
d 90 000 **e** 90 000 **f** 50
g 90 **h** 30 **i** 100
j 200 **k** 0.5 **l** 0.3
m 0.006 **n** 0.05 **o** 0.0009
p 10 **q** 90 **r** 90
s 200 **t** 1000

5 Ayeton 850 to 949; Beeton 645 to 654; Ceeton 1045 to 1054

6 6.140 and 6.143

7 **a** **i** 15
ii 15.68
iii 0.68
iv Estimate is close to exact answer.
b **i** 90
ii 82.65
iii 7.35
iv Estimate is not very close to exact answer.
c **i** 300
ii 422.84
iii 122.84
iv Estimate is not close to exact answer.
d **i** 2800
ii 2809.95
iii 9.95
iv Estimate is close to exact answer.

Exercise 26B Selecting and applying the correct operation to solve a problem

1 **a** 183 minutes or 3 hours 3 minutes
b 17 minutes

2 435

3 **a** 47
b Jake = £75, Tomas = £60, Theo = £100

4 **a** 385 **b** 36 **c** £1.61
d 63 **e** 125 **f** 720

5 12 °C

6 62 °C

7 6 rolls

Exercise 26C Fractions, decimals and percentages

1 **a** £20 **b** 21 cm **c** 32 g
d 47 litres **e** £54 **f** 51 mm
g 120 kg **h** 351 ml

2 **a** 374 g **b** 67.2 m **c** £49.20

3 **a** £84 **b** 14.84 g **c** £43.26

4 £35 568

5 15 336

6 $\frac{6}{40} \times 100 = 15\%$

7 £6384

8 2112

9 £459

10 Goods are cheaper, for example: £100 + 10% = £100 + £10 = £110; £110 − 10% = £110 − £11.00 = £99.00.

Exercise 26D Perimeter, area and volume

1 **a** 20 cm **b** 18 cm **c** 36 cm

2 **a** **i** 16 cm^2
ii 16 cm
b **i** 36 mm^2
ii 30 mm
c **i** 160 m^2
ii 56 m

3 Yes; use fractions of a cm, e.g. a rectangle 2 cm by 2.5 cm.

4 **a i** 33 cm^2

ii 28 cm

b i 40 cm^2

ii 32 cm

c i 30 cm^2

ii 38cm

d i 60 cm^2

ii 40 cm

e i 500 cm^2

ii 120 cm

5 **a** 2.5 m^2

b Yes; the area in one roll is 2.5 m^2.

6 **a i** 12 cm

ii 6 cm^2

b i 24 cm

ii 24 cm^2

c i 70 cm

ii 210 cm^2

7 **a** 40 cm^2 **b** 168 m^2 **c** 32 m^2

8 162 cm^2

9 **a** 1800 cm^2 **b** 120 cm^2 **c** 116 cm^2

10 375 tiles

11 Volumes are: A 2587.5 cm^3, B 2530 cm^3, C 3225.24 cm^3. The volume of cuboid C is closest to 3000 cm^3.

Exercise 26E Speed, distance and time

1 15 mph

2 180 miles

3 46 mph

4 2 p.m.

5 **a** 30 minutes **b** 12 mph

6 **a** 1.25 h **b** 45 miles

Exercise 26F Ratio and proportion

1 **a** 300 **b** 25%

2 2 m and 18 m

3 45

4 **a** 200 g **b** 320 g

5 Fred's, at 4 : 1; Jodie's is only 3.5 : 1.

6 £8

7 £49.60

8 **a** 6 litres **b** 405 miles

9 **a** £2.50 for a twin-pack

b £2.20 for 1

c 95p for 10

d £2.75 for 750 g

10 **a** large 350g bottle, 4.0 g/p (compared with 3.6 g/p)

b large 200 g bar, 2.2 g/p (compared with 1.6 g/p)

c small 500 g tin, 0.64 g/p (compared with 0.63 g/p)

d large 900 g jar, 3.8 g/p (compared with 3.5 g/p)

Chapter 27 Reading measurements using a straightforward scale on an instrument and interpreting measurements to make decisions

Exercise 27A Reading measurements on scales

1 **a** 1.55 m **b** 9.5 cm **c** 0.78 m

d 3.1 km **e** 3.1 m **f** 3.05 m

g 15.6 cm **h** 2.18 km **i** 1.07 m

j 13.24 m **k** 0.175 km **l** 0.083 m

m 5.12 km **n** 8.15 kg **o** 1.36 l

2 **a** 0.12 kg **b** 0.15 l **c** 7.5 l

d 3.8 kg **e** 0.015 l **f** 820 cm

g 71 000 m **h** 8600 mm **i** 156 mm

j 83 cm **k** 5150 m **l** 18.5 mm

3 **a** 2 cm **b** 5.5 cm **c** 8.2 cm

d 11.7 cm **e** 13.9 cm

4 No, she does not have enough wood. The shelves measure 74.5 cm and 75.8 cm, giving a total of 150.3 cm. The plank of wood is 150 cm which is less than 150.3 cm.

5 **a** 1.4 kg **b** 2.2 kg

c 3.6 kg **d** 4.7 kg

6 Yes, he can. The combined weight of the suitcase and trainers is 19.2 kg + 0.7 kg = 19.9 kg, which is less than 20 kg.

7 **a** 1.3 litres **b** 0.8 litres

c 1.7 litres **d** 0.4 litres

8 No, as 1200 ml + 700 ml = 1900 ml (1.9 l), which is 100 ml less than 2 litres.

9 **a** 14 °C **b** 56 °C

c –7 °C **d** –0.6 °C

10 11 °C

Chapter 28 Extracting and interpreting data from at least two different straightforward graphical forms

Exercise 28A Interpreting tables

1 Company A; it meets all of her criteria.

2 Flexible ticket; it meets all of the Browns' criteria.

Exercise 28B Interpreting different types of graphical representation

1 **a** $\frac{1}{4}$

b Student's own comparison, for example: the number of people that do not own a pet is the same as the number of people that do own a pet.

c $\frac{60}{360}$ or $\frac{1}{6}$

d 2400

2 **a** $\frac{5}{36}$

b **i** Northern Highlands 2500

ii Southern Highlands 1000

iii Central Belt 2300

iv Southern Scotland 1400

3 **a** $\frac{1}{4}$

b Rarely

c No; it only shows proportions.

d What is your age? How often do you take exercise? How often do you see a doctor? There are other possibilities.

4 **a** Emmerdale

b 50

c No; friends are likely to be of a similar age and will have similar interests, and are more likely to be girls than boys, etc.

5 **a** 9

b The graph makes it look as though the boys have done better because their bars are higher, but this is just because there are more boys than girls.

6 No, because the graph starts at 50, not at zero. 100 is not 3 times 65.

7 **a** August, 250 yen

b 25 yen

c June and July

d 51 200 yen

Exercise 28C Measurement and scale

1 **a** 2 m **b** 5 m

2 **a** 16.5 m **b** 90–120 m

3 **a** **i** 90 cm by 60 cm

ii 90 cm by 60 cm

iii 60 cm by 60 cm

iv 90 cm by 45 cm

b 10 800 cm^2

c No, because the space is a maximum of 60 cm wide so 65 cm is too big.

4 **a** accurate scale drawing

b 4.12 m

c No, because the ladder is 4.12 m and, even if the ladder was placed against the wall, the height of the window cleaner plus the ladder would still not be enough to reach beyond the bottom of the window.

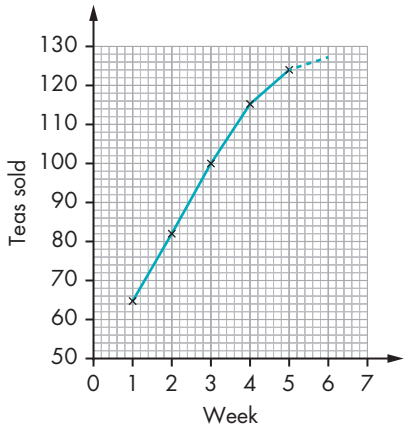
Chapter 29 Making and explaining decisions based on the interpretation of data

Exercise 29A Drawing and interpreting graphs based on given data

1 **a** No; 9 were sold Monday and 12 on Friday.

b Any two mistakes, for example: no label for vertical axis; bar chart does not start at zero; bar chart starts at 6 but there is no zigzag line; gaps between the bars are not the same.

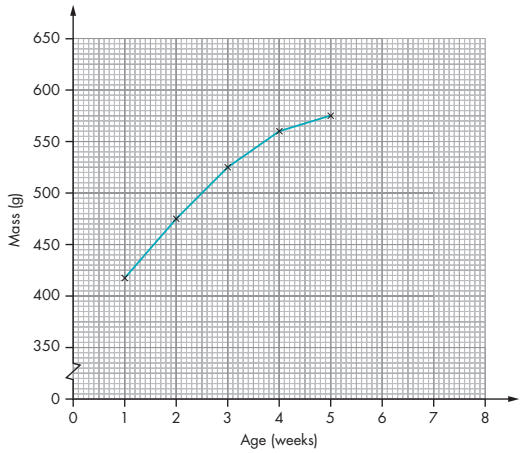
2 **a**



b 128–130

c The same people keep coming back and tell others, but new customers each week become increasingly difficult to find.

3 **a**

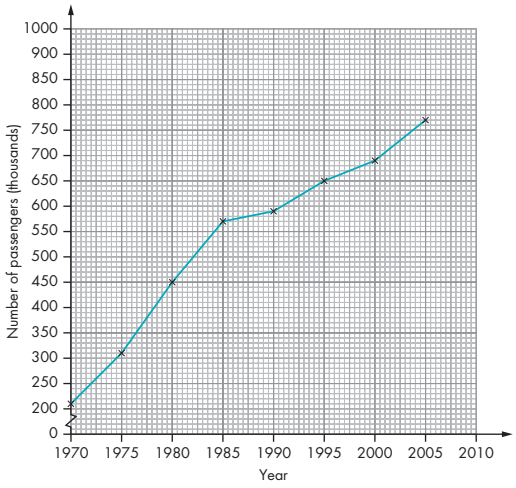


b about 600 g

c It is outside the range of the data so we cannot be sure of the rate at which the kitten will continue to grow.

4 All the temperatures were presumably higher than 10 °C.

5 **a**

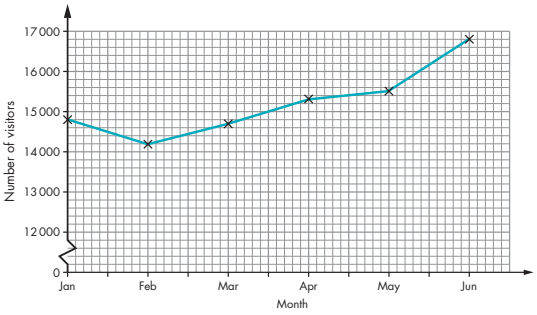


b 830–880

c 1975–1980

d It is increasing all the time, so maybe the population is increasing.

6 **a**



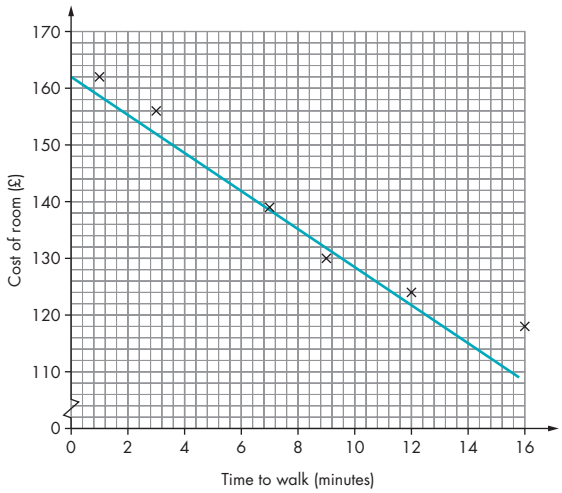
b 17 000–17 500

c May and June

d More people visit tourist attractions during summer/holidays.

e No; November is outside the range of the given data, and seasonal factors may affect numbers.

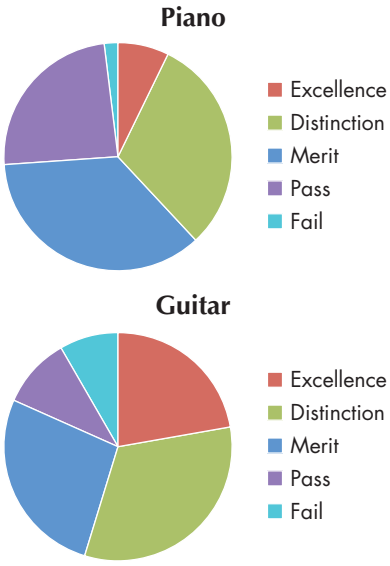
7 **a, c**



b negative correlation

d approximately 4.5 miles (answer may vary depending on best-fitting line drawn)

8 **a**



b Piano; although the number achieving 'Pass with excellence' was lower, the numbers achieving 'Pass with excellence / distinction / merit' were higher, demonstrating stronger performances overall.

Chapter 30 Making and explaining decisions based on probability

Exercise 30A Making decisions using probability

1 tossing a head, as 0.5 > 0.333

2 Kayton, as 0.4375 > 0.417

3 Kendra, as 0.217 > 0.15

4 MISSISSIPPI, as 0.364 > 0.286

5 two 6s, as 0.0278 > 0.0192

6 triangle, as 0.136 > 0.111

7 second bag, as 0.2 > 0.177

8 practical, as 0.458 > 0.429

9 train, as 0.111 > 0.08

10 Windup, as 0.154 > 0.09

11 March, as 0.258 > 0.25

12 S4B, as 0.14 > 0.125

13 REGULAR, as 0.429 > 0.4