



for **AQA, Edexcel** and **OCR**  
**two-tier GCSE mathematics**

## **Answers for *Foundation transition practice***

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# 1 Odds, evens, multiples, factors

## A Odd and even numbers

### B Divisibility (p 7)

- 1 (a) 14, 16, 30, 40, 50 (b) 13, 15, 47  
 (c) 30, 40, 50 (d) 16, 40
- 2 (a) (i) NTARI (ii) XTAI  
 (iii) EBIK (iv) ARC  
 (b) (i) TRAIN (ii) TAXI  
 (iii) BIKE (iv) CAR

## C Multiples

### D Factors (p 7)

- 1 6, 12, 18, 24, 30, 36
- 2 6
- 3 18, 27, 54, 90
- 4 (a) (i) 8, 16, 40, 48 (ii) 10, 25, 40  
 (b) (i) 2, 6, 8 (ii) 2, 6, 10
- 5 (a) 8 (b) 45 (c) 7

# 2 Mental methods 1

## A Place value (p 8)

- 1 (a) 2000 (b) 70 000
- 2 250 000
- 3 (a) 2715 (b) 32 961 (c) 12 874 (d) 974 513
- 4 (a) 36 299 (b) 36 779 (c) 38 279 (d) 76 279
- 5 (a) 3060, 3600, 6003, 6030, 6300  
 (b) 24 781, 24 817, 27 418, 27 841, 28 741  
 (c) 35 141, 35 432, 35 675, 36 002, 36 143

## B Rounding (p 8)

- 1 (a) 30 (b) 50 (c) 280 (d) 760 (e) 6070
- 2 (a) 400 (b) 200 (c) 2200 (d) 58 800 (e) 4900
- 3 (a) 2000 (b) 7000 (c) 25 000 (d) 87 000 (e) 21 000
- 4 (a) 9000 (b) 8600 (c) 8610
- 5 (a) 600 000 (b) 590 000 (c) 587 000

# 3 Shapes

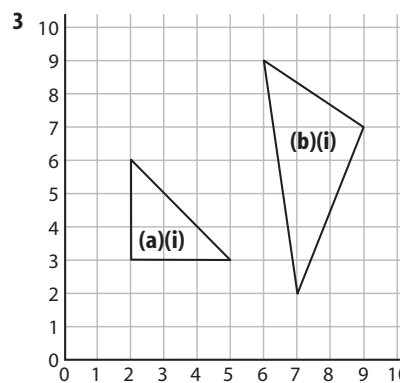
## A Circles (p 9)

- 1 (a) 1 cm (b) 3 cm
- 2 (a) A circle of radius 5 cm  
 (b) Centre labelled  
 (c) Circumference labelled

## B Triangles (p 9)

- 1 (a) A triangle that has edges all the same length is **equilateral**.  
 (b) A triangle that has two edges the same length is **isosceles**.  
 (c) A triangle with edges that are all different lengths is **scalene**.

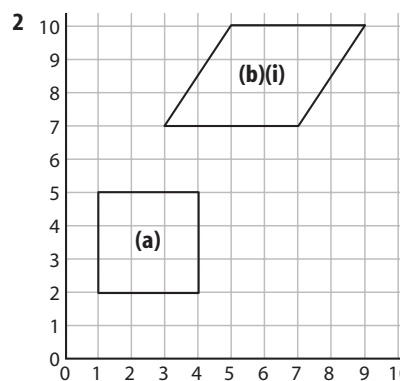
### 2 Equilateral



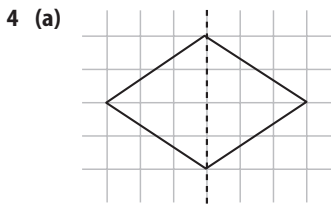
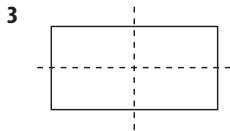
- (a) (ii) Isosceles (and right-angled)  
 (b) (ii) Scalene

## C Quadrilaterals (p 10)

- 1 (a) D (b) E (or A or B or D)  
 (c) A (or B or D) (d) C (or D)



- (a) (ii) (4, 2)  
 (b) (ii) Parallelogram



(b) Rhombus

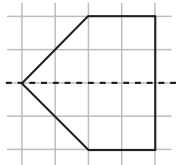
**D More than four edges** (p 10)

1 (a) Hexagon (b) 5

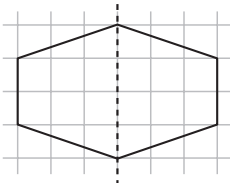
2 (a) (i) A, F, G, H (ii) B, D, E

(b) (i) C (ii) E (iii) F

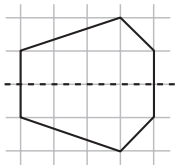
3 (a) (i) (ii) Pentagon



(b) (i) (ii) Hexagon

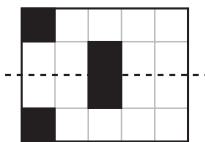


(c) (i) (ii) Hexagon

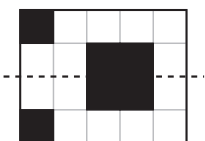


**E Shading squares to give reflection symmetry** (p 11)

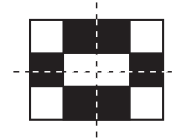
1 Any pattern with 6 squares shaded including these



that also has one horizontal line of symmetry, for example:



2 (a), (b)



**4 Adding and subtracting whole numbers**

**A Using written and mental methods** (p 12)

1 (a) 79 (b) 65 (c) 122 (d) 686  
 (e) 807 (f) 343 (g) 31 (h) 6  
 (i) 27 (j) 133 (k) 138 (l) 288

2 (a) 82 (b) 50 (c) 34

3 (a) £75 (b) £25

4 (a) 
$$\begin{array}{r} 31 \\ + 46 \\ \hline 77 \end{array}$$
 (b) 
$$\begin{array}{r} 52 \\ + 38 \\ \hline 90 \end{array}$$
 (c) 
$$\begin{array}{r} 56 \\ - 24 \\ \hline 32 \end{array}$$
 (d) 
$$\begin{array}{r} 72 \\ - 28 \\ \hline 44 \end{array}$$

5 (a) (i) 53 and 47 (ii) 38 and 26 (iii) 53 and 9

(b) (i) 57 and 47 (ii) 38 and 21 (iii) 57 and 38

6 (a) 20 and 30 (b) 17 and 23

## 5 Listing

### A Arrangements (p 13)

1

First	Second	Third
blue	white	yellow
blue	yellow	white
white	blue	yellow
white	yellow	blue
yellow	blue	white
yellow	white	blue

2 (a)

First	Second	Third
4	1	5
4	5	1
1	4	5
1	5	4
5	1	4
5	4	1

(b) 541

(c) 3

### B Combined choices (p 13)

1 (a)

Bread	Filling
white	egg
white	beef
white	cheese
brown	egg
brown	beef
brown	cheese

(b) 4

2 (a)

Maddie	Louise
dance	dance
dance	acting
dance	photography
acting	dance
acting	acting
acting	photography
photography	dance
photography	acting
photography	photography

(b) 4

## 6 Multiplying and dividing whole numbers

### A Multiplying whole numbers (p 14)

1 (a) 51      (b) 95      (c) 192      (d) 324  
 (e) 246      (f) 413      (g) 332      (h) 380

2 135

3 204p or £2.04

4 105 minutes or 1 hour 45 minutes

5 224

6 £198

### B Dividing whole numbers (p 14)

1 (a) 34      (b) 18      (c) 13      (d) 14  
 (e) 11      (f) 23      (g) 26      (h) 16

2 16

3 15

4 (a) 23 remainder 2

(b) 16 remainder 3

(c) 14 remainder 2

(d) 24 remainder 1

5 13

6 12

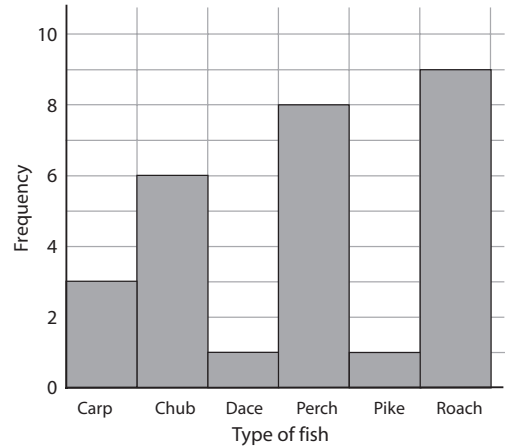
## Mixed practice 1 (p 15)

- 1 (a) (i) 41 (ii) 30 (iii) 16 (iv) 2  
 (b) 16 and 26  
 (c) 16 and 30 or 2 and 16
- 2 Octagon
- 3 (a) 9821  
 (b) 800 or 8 hundreds  
 (c) Nine thousand, eight hundred and twenty-one  
 (d) 9800
- 4 5413
- 5 (a) 4 cm  
 (b) (i) Isosceles (ii) 1
- 6 291
- 7
- | Drink  | Roll    |
|--------|---------|
| tea    | bacon   |
| tea    | sausage |
| tea    | egg     |
| tea    | ham     |
| coffee | bacon   |
| coffee | sausage |
| coffee | egg     |
| coffee | ham     |
- 8 (a) 90 (b) 8
- 9 2010
- 10 28

## 7 Representing data

### A Frequency charts and mode (for types of things) (p 16)

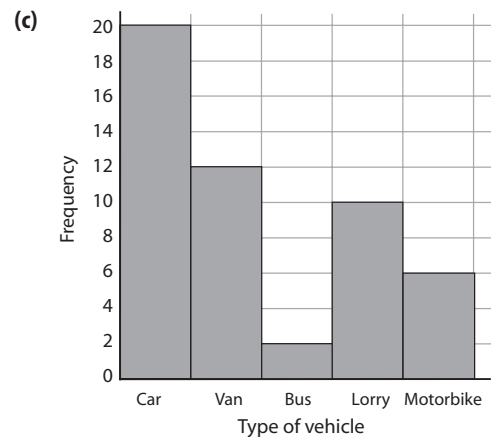
- 1 (a) 6  
 (b) Perch  
 (c) 25  
 (d) Roach  
 (e)



- 2 (a)

Type of vehicle	Tally
car	
van	
bus	
lorry	
motorbike	I

- (b) Car



### B Dual bar charts

### C Pictograms (p 16)

- 1 (a) Criminal damage (b) Burglary, theft  
 2 (a) 40 (b) 35 (c) Meat (d) 160

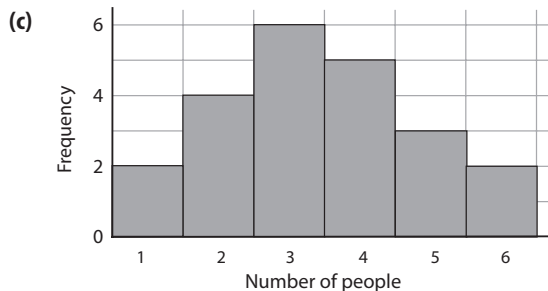
## D Frequency charts and mode (for quantities) (p 17)

1 (a) 7 (b) 1 (c) 22

2 (a)

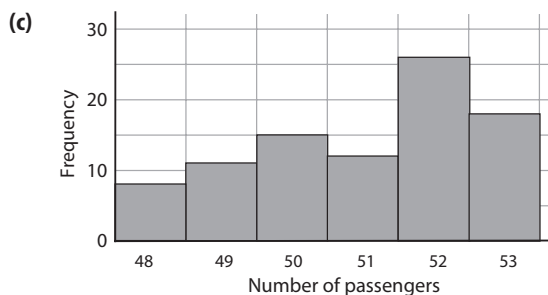
Number in house	Tally
1	II
2	IIII
3	IIII I
4	IIII
5	III
6	II

(b) 3 people



3 (a) 52

(b) 90



## 8 Fractions

### A Recognising fractions (p 18)

1 (a) Yes (b) No,  $\frac{1}{4}$  (c) No,  $\frac{1}{2}$  (d) No,  $\frac{2}{3}$

2 (a)  $\frac{1}{6}$  (b)  $\frac{3}{4}$  (c)  $\frac{3}{8}$  (d)  $\frac{5}{9}$

3 5 by 2 rectangle with 4 squares shaded

## B Finding a fraction of a number (p 18)

1 (a) To find  $\frac{1}{3}$  of a number divide it by 3.

(b) (i) 2 (ii) 5 (iii) 8 (iv) 10 (v) 25

2 (a) 24 (b) 10 (c) 7 (d) 11 (e) 9

3 (a) 10 (b) 20 (c) 30 (d) 40

4 (a) 16 (b) 21 (c) 25 (d) 60 (e) 45

5  $\frac{3}{4}$  of 80 and  $\frac{2}{3}$  of 90 (60)

$\frac{4}{5}$  of 100 and  $\frac{2}{3}$  of 120 (80)

$\frac{3}{4}$  of 120 and  $\frac{3}{5}$  of 150 (90)

## 9 Decimal places

### A One decimal place (p 19)

1 (a) 7.1 (b) 7.5 (c) 0.4

(d) 0.7 (e) 20.2 (f) 20.9

2 3.5, 4, 3.9, 4.8

3 (a) 4.8, 5.3, 6.3, 8.5, 10.4 (b) 0.3, 0.8, 1, 1.3, 2

4 (a) Longer (b) 4.5 cm

5 7.5

6 (a) Hayley (b) David (c) Harry

### B Two decimal places (p 19)

1 (a) 4.53 (b) 4.59 (c) 8.81 (d) 8.9

(e) 8.94 (f) 6.02 (g) 6.05 (h) 0.01

(i) 0.07 (j) 0.16

2 (a) False (b) True (c) True (d) False

3 BURGER

4 4.72, 4.68, 4.7

5 6.9, 6.09, 6, 5.6, 5.49

6 1.8 kg

7 (a) 10.5 (b) 1.85 (c) 7.05 (d) 4.95

### C Decimal lengths (p 20)

1 (a) 3.7 m (b) 2.9 m (c) 0.9 m

2 Yes

3 C (2.43 m) and D (2.34 m)

## 10 Median and range

### A Median (for an odd number of data items) (p 21)

- 1 (a) £8750, £8900, £9050, £9150, £9250, £9400, £9550, £9600, £9700  
(b) £9250
- 2 (a) 187 (b) 151

### B Median (for any number of data items) (p 21)

- 1 £5.15
- 2 7
- 3 (a) 61 (b) 127

### C Range (p 21)

- 1 (a) £135 (b) £108 (c) £27
- 2 (a) Median 103, range 41 (b) Median 202, range 67

### D Comparing two sets of data (p 22)

- 1 (a) 20 (b) 32 (c) 22  
(d) 45 (e) Away (f) Away
- 2 (a) (i) 64 (ii) 33  
(b) (i) 69 (ii) 21  
(c) Women  
(d) Men
- 3 (a) (i) 59 (ii) 52  
(b) (i)  $67\frac{1}{2}$  (ii) 44  
(c) Females  
(d) Males

## 11 Mental methods 2

### A Multiplying by 10, 100, 1000

### B Dividing by 10, 100, 1000 (p 23)

- 1 (a) 420 (b) 25 700 (c) 1900 (d) 96 000 (e) 60 000  
(f) 28 (g) 310 (h) 52.9 (i) 350 (j) 40
- 2 (a) 50 (b) 47 (c) 6.2 (d) 36.8 (e) 4.25  
(f) 0.96 (g) 0.17 (h) 0.27 (i) 0.74 (j) 0.08
- 3 (a) 50 g (b) 3.5 g
- 4 (a) 45p (b) 0.8 cm
- 5 £13
- 6 12p

### C Multiplying by numbers ending in zeros (p 23)

- 1 (a) 60 (b) 800 (c) 240 (d) 4800 (e) 6300
- 2 (a) 240 (b) 2400 (c) 2400 (d) 24 000  
(e) 240 000 (f) 15 000 (g) 1200 (h) 90 000  
(i) 210 000 (j) 40 000
- 3 (a) £15 (b) £80 (c) £32 (d) £300

## 12 Solids, nets and views

### A Solids and nets (p 24)

- 1 (a) Cylinder (b) Sphere (c) Prism
- 2 (a) (i) Cuboid (ii) Pyramid (iii) Cube  
(b) (i) 6 faces, 12 edges, 8 vertices  
(ii) 5 faces, 8 edges, 5 vertices  
(iii) 6 faces, 12 edges, 8 vertices

### B Views (p 24)

- 1 (a) T (b) S (c) R (d) Q (e) P

# 13 Weighing

## A Grams and kilograms (p 25)

- 1 (a) kilograms (b) grams  
 2 (a) 4000 (b) 6000 (c) 13 000  
 (d) 250 (e) 1500  
 3 750 g  
 4 20 days  
 5 1 kg

## B Using decimals (p 25)

- 1 (a) 200 g (b) 2500 g (c) 650 g  
 (d) 1250 g (e) 5680 g

2 (a)

Bird	Weight in grams	=	Weight in kilograms
Herring gull	1200 g	=	<b>1.2 kg</b>
Common gull	450 g	=	<b>0.45 kg</b>
Mute swan	<b>12000 g</b>	=	12 kg
Canada goose	<b>4500 g</b>	=	4.5 kg

- (b) Mute swan  
 (c) Common gull  
 3 3.5 kg butter  
 1.5 kg sugar  
 5 kg plain flour  
 4 900 g  
 5 4 g, 140 g, 0.4 kg, 1.4 kg, 4 kg

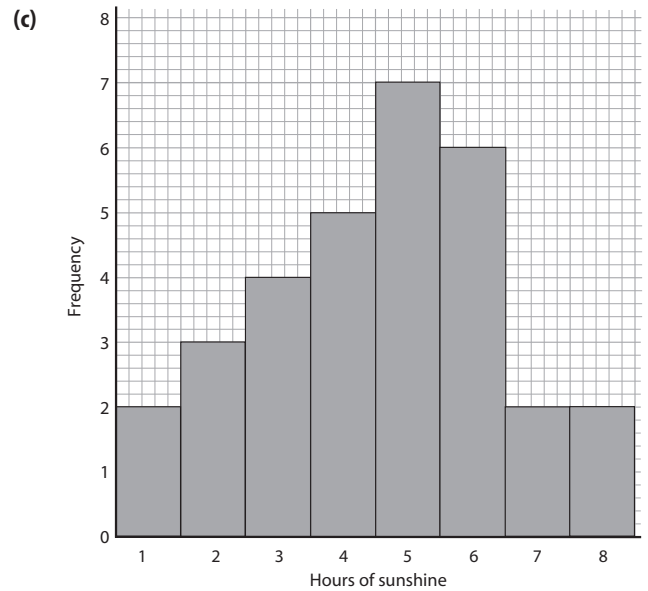
# Mixed practice 2 (p 26)

- 1 45  
 2 (a) 65 67 68 69 70 72 73 74 74 78  
 (b) 71 cm (c) 13 cm  
 3 12  
 4 9.5

5 (a)

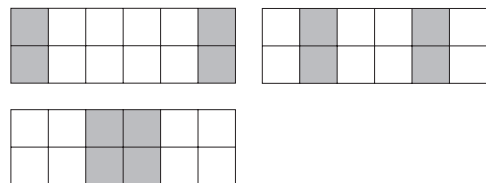
Hours of sunshine	Tally	Frequency
1	II	2
2	III	3
3	IIII	4
4	IIII	5
5	IIII II	7
6	IIII I	6
7	II	2
8	II	2

(b) 4



(d) 5 hours

6 One of these diagrams:



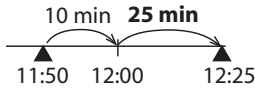
- 7 3.5 kg or  $3\frac{1}{2}$  kg  
 8 250 g,  $\frac{1}{2}$  kg, 0.75 kg, 1.5 kg  
 9 3.6  
 10 (a) 400 (b) 30 (c) 12 000 (d) 0.51  
 11 160 g or 0.16 kg  
 12 Prism

## 14 Time and travel

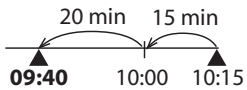
### A Understanding 12-hour and 24-hour clock time (p 27)

- 1 (a) (i) 7:15 a.m. (ii) 07:15  
 (b) (i) 4:25 p.m. (ii) 16:25  
 (c) (i) 8:45 p.m. (ii) 20:45
- 2 (a) 22:35 (b) 09:20 (c) 15:30
- 3 (a) 7:00 a.m. (b) 11:55 a.m. (c) 5:30 p.m.  
 (d) 9:40 p.m. (e) 12:10 a.m.

### B Time intervals (p 27)

- 1 (a)  (b) 35 minutes
- 2 (a) 20 minutes (b) 35 minutes (c) 55 minutes
- 3 8:40 a.m.
- 4 (a) 2 hours 45 minutes (b) 3 hours 30 minutes  
 (c) 2 hours 25 minutes
- 5 (a) 2 hours 20 minutes (b) 10:15 p.m.

### C Working out starting times (p 28)

- 1 (a) 13:00 (b) 6:30 a.m. (c) 9:15 a.m.
- 2 (a)  (b) 09:40
- 3 (a) 15:55 (b) 8:45 p.m.
- 4 08:20
- 5 4:45 p.m.

### D Timetables (p 28)

- 1 (a) 13:25 (b) 15:10  
 (c) 29 minutes (d) 12:20
- 2 (a) 1803  
 (b) 1728  
 (c) 26 minutes  
 (d) (i) 20 minutes (ii) 1838

## 15 Angle

### A Drawing, measuring and sorting angles (p 29)

- 1 (a)  $90^\circ$  (b)  $180^\circ$  (c)  $90^\circ$  (d)  $270^\circ$
- 2 (a)  $70^\circ$  (b)  $250^\circ$  (c)  $90^\circ$  (d)  $125^\circ$
- 3 (a) Acute (b) Reflex  
 (c) Right angle (d) Obtuse
- 4 (a) Acute (b) Reflex (c) Obtuse  
 (d) Obtuse (e) Acute
- 5 Drawings of angles with the following sizes  
 (a)  $45^\circ$  (b)  $200^\circ$  (c)  $95^\circ$  (d)  $160^\circ$  (e)  $85^\circ$

### B Turning (p 29)

- 1 (a)  $60^\circ$  (b)  $120^\circ$  (c)  $150^\circ$  (d)  $270^\circ$
- 2 (a) Acute (b) Obtuse (c) Obtuse (d) Reflex
- 3 (a) 10 (b) 5 (c)  $210^\circ$

### C Angles in shapes (p 30)

- 1 (a) Right-angled, isosceles (b)  $180^\circ$   
 (c) Two sides are the same length.
- 2 (a) All four sides are equal. Opposite angles are equal.  
 (b) Rhombus

### D Estimating angles (p 30)

- 1 (a) Less (b) More (c) Less (d) More
- 2 (a)  $40^\circ$  (b)  $70^\circ$  (c)  $50^\circ$  (d)  $80^\circ$
- 3 C
- 4 A  $100^\circ$ , B  $140^\circ$ , C  $120^\circ$

## 16 Length

### A Centimetres and millimetres (p 31)

- 1 (a) (i) 20 mm (ii) 2 cm  
(b) (i) 66 mm (ii) 6.6 cm

2 (a)

Bird	Length in millimetres	Length in centimetres
Goldcrest	90 mm =	<b>9 cm</b>
Firecrest	<b>85 mm</b> =	8.5 cm
Blue tit	113 mm =	<b>11.3 cm</b>
Long-tailed tit	<b>140 mm</b> =	14 cm

- (b) Firecrest  
(c) Long-tailed tit
- 3 3 mm, 1.3 cm, 3 cm, 31 mm

### B Metres and centimetres

### C Kilometres (p 31)

- 1 (a) m (b) cm (c) km (d) cm  
2 (a) 300 cm (b) 50 cm (c) 125 cm  
(d) 260 cm (e) 85 cm  
3 (a) 3000 m (b) 10 000 m (c) 4000 m  
(d) 1500 m (e) 750 m  
4 60 cm or 0.6 m  
5 (a) 40 mm, 0.4 m, 400 cm, 4 km  
(b) 12 cm, 102 cm, 1.2 m, 12 m  
6 Doug is 5 cm taller.

## 17 Squares and square roots

### A Square numbers and square roots

### B Using shorthand (p 32)

- 1 49, 64, 81  
2 (a) 25 (b) 5  
3 (a) 4 squared is 16  
(b) The square root of 81 is 9  
(c)  $3^2 = 9$   
(d)  $\sqrt{49} = 7$   
4 (a) 36 (b) 2 (c) 1 (d) 8 (e) 100  
5 (a) 9 (b) 25 (c) 16  
6  $3^2$  is bigger, because  $3^2 = 9$  and  $\sqrt{36} = 6$ .

### C Using a calculator (p 32)

- 1 (a) 196 (b) 529 (c) 324  
(d) 12 (e) 30 (f) 15  
2 (a) 324 (b) 784 (c) 900  
3 256 and 625

## 18 Adding and subtracting decimals

### A Adding decimals (p 33)

- 1 (a) 0.9 (b) 7.8 (c) £5.50 (d) £3.50  
2 £2.15  
3 (a) 9.3 (b) 12.3 (c) 19.1 (d) 60.1  
4 0.8 kg  
5 2.05 m  
6 (a) £9.78 (b) 15.91 (c) £29.12 (d) 30.15

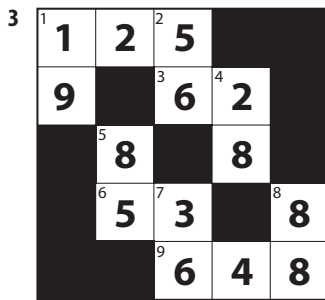
### B Subtracting decimals (p 33)

- 1 (a) 7.7 (b) 4.2 (c) £1.40 (d) £5.30  
2 1.6 m  
3 2.3 kg  
4 £4.95  
5 £5.17  
6 (a) 4.51 (b) 2.5 (c) 3.45 (d) 1.65  
(e) 4.85 (f) 4.45 (g) 3.69 (h) 5.35

## 19 Mental methods 3

### A Multiplying and dividing by 4 and 5 (p 34)

- 1 (a) 72 (b) 130 (c) 136 (d) 255 (e) 140  
 (f) 240 (g) 168 (h) 315 (i) 500 (j) 410
- 2 (a) 21 (b) 23 (c) 36 (d) 42 (e) 60  
 (f) 124 (g) 53 (h) 65 (i) 47 (j) 250



- 4 (a)  $24 \xrightarrow{\times 2} 48 \xrightarrow{\times 2} 96 \xrightarrow{\times 2} 192$
- (b) (i) 104 (ii) 176 (iii) 136 (iv) 280
- 5 (a)  $184 \xrightarrow{\div 2} 92 \xrightarrow{\div 2} 46 \xrightarrow{\div 2} 23$
- (b) (i) 12 (ii) 16 (iii) 30 (iv) 56

### Mixed practice 3 (p 35)

- 1 25 minutes
- 2 120 cm
- 3 (a) 9.7 (b) 3.8 (c) 104 (d) 310 (e) 32
- 4 No, she is 5 minutes late.
- 5 230 cm
- 6 (a) 12.2 cm  
 (b) (i)  $b$   
 (ii) An estimate close to  $135^\circ$   
 (c) (i)  $a = 90^\circ, b = 135^\circ, c = 45^\circ, d = 90^\circ$   
 (ii) 2  
 (iii) Trapezium
- 7 12:35 or twenty-five to one
- 8 (a) No (b) 5
- 9 4500 metres
- 10 (a) 4 (b) 3 (c) 16 (d) 10
- 11 (a) 4.5 (b) 2.42 (c) 4.64 (d) 5.08

## 20 Number patterns

### A Simple patterns (p 36)

- 1 (a) 16  
 (b) An explanation such as:  
 You add 3 to get from one number to the next and  $13 + 3 = 16$ . So 16 is the next number.
- 2 (a) 20, 19 (b) 31, 35 (c) 15, 10 (d) 36, 43
- 3 (a) 24  
 (b) An explanation such as:  
 You add 4 to get from one number to the next and  $20 + 4 = 24$ . So 24 is the next number.  
 (c) 44  
 (d) An explanation such as:  
 All the numbers in the pattern are even and 73 is odd so it cannot be in the sequence.

### B Further patterns (p 36)

- 1 (a) 160  
 (b) An explanation such as:  
 You double the previous number to get the next number and  $80 \times 2 = 160$ . So 160 is the next number.
- 2 (a) 20, 26 (b) 4, 2
- 3 (a)  $5 \times 9 = 45$   
 $55 \times 9 = 495$   
 $555 \times 9 = 4995$   
 $5555 \times 9 = 49995$   
 $55555 \times 9 = 499995$   
 (b) An explanation such as:  
 In each multiplication the number of 9s is one less than the number of 5s. In Kyle's calculation there are seven 5s so there should be six not seven 9s.

## 21 Estimating and scales

### A Estimating lengths (p 37)

Estimates close to these are acceptable.

1 23 to 25 m

2 (a) 3 m (b) 1 m (c) 5 m

### B Reading and estimating from scales (p 37)

1 (a) (i) 2 (ii) 6

(b) (i) 25 (ii) 150

(c) (i) 5 (ii) 35

(d) (i) 20 (ii) 40

2 (a) 45 g (b) 10 g (c) 180 g

3 (a) About 3 (b) About 25 (c) About 30

(d) About 55

### C Decimal scales (p 38)

1 (a) 0.1 kg

(b) (i) 0.5 kg (ii) 2.2 kg

2 (a) 4.5 (b) 6.25 (c) 0.4 (d) 2.8

## 22 Multiplying and dividing decimals

### A Multiplying a decimal by a whole number (p 39)

1 (a) 1.6 (b) 1.5 (c) 4.8 (d) 9.6 (e) 5.5

2 (a) 9.5 (b) 33.2 (c) 23.4 (d) 55.8 (e) 36.4

3 (a)  $0.9 \times 3 = 2.7$  (b)  $8 \times 0.3 = 2.4$

(c)  $0.5 \times 9 = 4.5$  (d)  $1.6 \times 2 = 3.2$

(e)  $6 \times 0.4 = 2.4$  (f)  $4 \times 0.6 = 2.4$

4 1.8 litres

5 12.8 kg

### B Dividing a decimal by a whole number (p 39)

1 (a) 2.1 (b) 1.2 (c) 2.1 (d) 3.1 (e) 7.4

2 (a) 2.4 (b) 1.9 (c) 2.9 (d) 4.5 (e) 2.7

3 0.5 kg

4 A and D (6.4), C and F (9.2), E and G (7.3);

B (6.3) is the odd one out.

5 (a) 5.5 (b) 4.5 (c) 4.6 (d) 13.5 (e) 8.5

## 23 Area and perimeter

### A Shapes on a grid of centimetre squares (p 40)

1 (a) (i)  $4 \text{ cm}^2$  (ii) 10 cm

(b) (i)  $6 \text{ cm}^2$  (ii) 14 cm

(c) (i)  $6 \text{ cm}^2$  (ii) 14 cm

2 (a)  $3\frac{1}{2} \text{ cm}^2$  (b)  $5\frac{1}{2} \text{ cm}^2$  (c)  $5 \text{ cm}^2$  (d)  $6 \text{ cm}^2$

3  $7\frac{1}{2} \text{ cm}^2$  or  $8 \text{ cm}^2$

### B Area of rectangle and right-angled triangle (p 40)

1 (a)  $16 \text{ cm}^2$  (b)  $9 \text{ cm}^2$

2 1 cm by 48 cm, 2 cm by 24 cm, 3 cm by 16 cm,  
4 cm by 12 cm, 6 cm by 8 cm

3 (a)  $80 \text{ cm}^2$  (b)  $90 \text{ cm}^2$  (c)  $225 \text{ cm}^2$

4 (a)  $6 \text{ cm}^2$  (b)  $7\frac{1}{2} \text{ cm}^2$  (c)  $4 \text{ cm}^2$

### C Area of a shape made from simpler shapes (p 41)

1 (a) A sketch showing two ways of splitting into  
rectangles

(b)  $14 \text{ cm}^2$

(c) 18 cm

2 Area  $13 \text{ m}^2$ , perimeter 16 m

### D Using decimals (p 42)

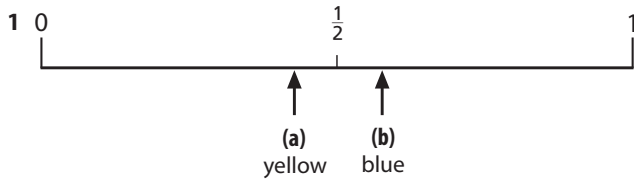
1 (a) (i)  $14 \text{ m}^2$  (ii)  $10.5 \text{ m}^2$

(b) (i)  $4.5 \text{ m}^2$  (ii)  $1.8 \text{ m}^2$  (iii)  $4.2 \text{ m}^2$

2 (a)  $26 \text{ cm}^2$  (b)  $23.1 \text{ cm}^2$

## 24 Probability

### A The probability scale (p 43)



- 2 (a) B (b) D (c) G (d) F

### B Equally likely outcomes (p 43)

- 1 (a) (i) White (ii) Yellow  
 (b) (i)  $\frac{1}{8}$  (ii)  $\frac{3}{8}$  (iii)  $\frac{4}{8}$  or  $\frac{1}{2}$   
 (c)  $\frac{5}{8}$
- 2 (a)  $\frac{4}{9}$  (b)  $\frac{3}{9}$  or  $\frac{1}{3}$  (c)  $\frac{2}{9}$  (d)  $\frac{3}{9}$  or  $\frac{1}{3}$   
 (e)  $\frac{3}{9}$  or  $\frac{1}{3}$  (f)  $\frac{1}{9}$  (g)  $\frac{6}{9}$  or  $\frac{2}{3}$
- 3 (a)  $\frac{5}{12}$  (b)  $\frac{7}{12}$  (c)  $\frac{9}{12}$  or  $\frac{3}{4}$  (d)  $\frac{3}{12}$  or  $\frac{1}{4}$   
 (e)  $\frac{3}{12}$  or  $\frac{1}{4}$  (f)  $\frac{1}{12}$  (g)  $\frac{6}{12}$  or  $\frac{1}{2}$  (h)  $\frac{2}{12}$  or  $\frac{1}{6}$   
 (i)  $\frac{4}{12}$  or  $\frac{1}{3}$
- 4 (a)  $\frac{1}{9}$  (b)  $\frac{4}{9}$  (c)  $\frac{5}{9}$  (d)  $\frac{6}{9}$  or  $\frac{2}{3}$   
 (e)  $\frac{2}{9}$  (f) 0
- 5 (a)  $\frac{1}{10}$  (b)  $\frac{2}{10}$  or  $\frac{1}{5}$  (c)  $\frac{3}{10}$  (d)  $\frac{4}{10}$  or  $\frac{2}{5}$   
 (e)  $\frac{5}{10}$  or  $\frac{1}{2}$  (f)  $\frac{7}{10}$  (g)  $\frac{8}{10}$  or  $\frac{4}{5}$  (h)  $\frac{9}{10}$
- 6 (a)  $\frac{1}{8}$  (b)  $\frac{3}{8}$  (c)  $\frac{3}{8}$  (d)  $\frac{6}{8}$  or  $\frac{3}{4}$   
 (e)  $\frac{6}{8}$  or  $\frac{3}{4}$  (f)  $\frac{4}{8}$  or  $\frac{1}{2}$
- 7 (a)  $\frac{8}{15}$  (b)  $\frac{7}{15}$

## Mixed practice 4 (p 45)

- 1 (a) 45  
 (b) An explanation such as:  
 You add 7 to get from one number to the next and  
 $38 + 7 = 45$ . So 45 is the next number.
- 2 (a) 155 g (b) 5.4 kg
- 3 7 m
- 4 (a)  $\frac{6}{10}$  or  $\frac{3}{5}$  (b)  $\frac{5}{10}$  or  $\frac{1}{2}$  (c)  $\frac{2}{10}$  or  $\frac{1}{5}$
- 5 21, 28
- 6  $\frac{3}{6}$  or  $\frac{1}{2}$
- 7 6.7
- 8 (a) 9 m  
 (b) (i)  $6 \text{ m}^2$  (ii)  $4.5 \text{ m}^2$  (iii)  $9.5 \text{ m}^2$

## 25 Enlargement

### A Enlargement on squared paper (p 46)

- 1 The required enlargements

### B Scale factor (p 46)

- 1 (a) Scale factor = 2 (b) 3 (c) 34 cm  
 2 (a) 2 (b) AC was 6 cm; BC was 2.5 cm.

## 26 Negative numbers

### A Putting temperatures in order (p 47)

- 1 (a) A:  $2^\circ\text{C}$ , B:  $-3^\circ\text{C}$  (b) B
- 2 (a) Zurich  
 (b) Milan  
 (c) 4  
 (d)  $-6^\circ\text{C}$ ,  $-4^\circ\text{C}$ ,  $-3^\circ\text{C}$ ,  $-2^\circ\text{C}$ ,  $0^\circ\text{C}$ ,  $1^\circ\text{C}$
- 3 (a)  $-8^\circ\text{C}$ ,  $-3^\circ\text{C}$ ,  $0^\circ\text{C}$ ,  $3^\circ\text{C}$ ,  $8^\circ\text{C}$   
 (b)  $-20^\circ\text{C}$ ,  $-15^\circ\text{C}$ ,  $-5^\circ\text{C}$ ,  $0^\circ\text{C}$ ,  $10^\circ\text{C}$

### B Temperature changes (p 47)

- 1 5 degrees
- 2  $3^\circ\text{C}$
- 3 (a)  $4^\circ\text{C}$  (b)  $-3^\circ\text{C}$
- 4 (a) 3 p.m.  
 (b)  $-4^\circ\text{C}$   
 (c) 3 degrees  
 (d) 3 degrees  
 (e) At 6 p.m. the temperature was 5 degrees warmer than at 6 a.m.  
 (f)  $-5^\circ\text{C}$
- 5 66 degrees

### C Negative coordinates (p 48)

- 1 (a) (i) C (ii) E  
 (b) (i) (3, -1) (ii) (-2, 0)
- 2 (a) KACBL  $\rightarrow$  BLACK (b) EGNER  $\rightarrow$  GREEN
- 3 (a) (-2, 0) (-3, -1) (2, 0) (-2, 2)  
 (b) (0, -1) (1, 0) (1, 3) (2, 0) (-1, -3) (2, -2)

## 27 Mean

### A Finding the mean of a data set (p 49)

- 1 (a) 360 cm (b) 72 cm  
2 22 seconds  
3 (a) 5 (b) 38 (c) 7.6 (d) 1.4  
4 (a) 10 (b) 9

### B Comparing two sets of data (p 49)

- 1 (a) (i) 31 g (ii) 28 g  
(b) Plant A  
(c) (i) 11 g (ii) 14 g  
(d) Plant B  
2 (a) Oak Avenue. The mean price for Oak Avenue is £137k; the mean price for Duck Hill is £133k.  
(b) Oak Avenue. The range for Oak Avenue is £50k; the range for Duck Hill is £29k.

## 28 Starting equations

### A Arrow diagrams

### B Think of a number (p 50)

- 1 (a) 7 (b) 9 (c) 7 (d) 15  
(e) 4 (f) 5  
2 (a) 8 (b) 36 (c) 21

### C Number puzzles

### D Using letters (p 50)

- 1 (a) 3 (b) 9 (c) 6 (d) 2 (e) 8  
(f) 3 (g) 3 (h) 25 (i) 12  
2 (a) 5 (b) 4 (c) 20  
3 (a) 4 (b) 9 (c) 8 (d) 4  
(e) 17 (f) 4 (g) 4 (h) 10  
4 (a)  $n = 15$  (b)  $n = 18$  (c)  $n = 9$  (d)  $n = 20$   
(e)  $n = 4$  (f)  $n = 7$  (g)  $n = 4$  (h)  $n = 5$   
(i)  $n = 6$  (j)  $n = 5$  (k)  $n = 14$  (l)  $n = 4$

## 29 Finding your way

### A Using a town plan (p 51)

- 1 The art gallery  
2 (a) C1 (b) D2 (c) B1  
3 Right  
4 Anticlockwise  
5 (a) Ten-pin bowling  
(b) About 1600 metres or 1.6 km  
6 (a) Instructions such as:  
Go left out of the front of the cinema and along Shaw Road. At the junction with Town Way turn left. The bus station is about 600 m on your right.  
(b) Instructions such as:  
Come out of the town hall on to Town Way and go right. Take the first left into Park Avenue, the first right into Davy Street and the first left into Budd Street. Just after Budd Street bends to the right, the church is on your left.

## Mixed practice 5 (p 52)

- 1 (a) North-east  
(b) Star Street  
(c) Directions such as:  
Turn right into Praed Street. Take the second turning on the right into Norfolk Place. Keep walking in a south-east direction down Norfolk Place and cross Sussex Gardens into Radnor Place.  
2 2  
3 (a) Mumbai (b) Moscow (c) 17 degrees (d)  $-13^{\circ}\text{C}$   
4 (a)  $n = 7$  (b)  $n = 6$  (c)  $n = 5$  (d)  $n = 16$   
5 (a) £11 (b) £11

## 30 Volume

### A Counting cubes (p 53)

- 1 (a)  $4 \text{ cm}^3$  (b)  $4 \text{ cm}^3$  (c)  $5 \text{ cm}^3$  (d)  $6 \text{ cm}^3$   
 2 (a)  $12 \text{ cm}^3$  (b)  $30 \text{ cm}^3$  (c)  $42 \text{ cm}^3$   
 3 (a) A cuboid (b) 12 (c) 3 (d)  $36 \text{ cm}^3$   
 4 (a)  $16 \text{ cm}^3$  (b)  $18 \text{ cm}^3$  (c)  $30 \text{ cm}^3$

## 31 Evaluating expressions

### A Simple substitution (p 54)

- 1 (a) 6 (b) 11 (c) 3 (d) 0  
 2 (a) 12 (b) 24 (c) 3 (d) 2  
 3 (a) 11 (b) 4 (c) 24 (d) 2

### B Rules for calculation (p 54)

- 1 (a) 20 (b) 14 (c) 25 (d) 13  
 (e) 5 (f) 8 (g) 9 (h) 4  
 2 (a) 8 (b) 1 (c) 8 (d) 17  
 (e) 1 (f) 7 (g) 2 (h) 15  
 3 (a) 21 (b) 8 (c) 2  
 4 (a) 7 (b) 13 (c) 7 (d) 3  
 (e) 1 (f) 5 (g) 2 (h) 2

### C Substituting into linear expressions (p 54)

- 1 (a) 25 (b) 30 (c) 5 (d) 2  
 2 (a) 10 (b) 6 (c) 4 (d) 2

3 (a)

	$n = 2$	$n = 4$	$n = 6$	$n = 8$
$2n + 12$	16	20	24	28
$3n - 2$	4	10	16	22
$3(n + 2)$	12	18	24	30
$2(n - 1)$	2	6	10	14
$\frac{n+10}{2}$	6	7	8	9
$\frac{n}{2} - 1$	0	1	2	3

- (b) (i)  $2(n - 1)$  (ii)  $\frac{n}{2} - 1$   
 (iii)  $2n + 12$  and  $3(n + 2)$

### D Formulas in words (p 55)

- 1 (a) 2 hours (b) 4 hours (c) 5 hours  
 2 (a) £3.75 or 375p (b) £4.50 or 450p  
 (c) £5.25 or 525p  
 3 (a) 90 minutes or 1 hour and 30 minutes  
 (b) 126 minutes or 2 hours and 6 minutes  
 (c) 150 minutes or 2 hour and 30 minutes  
 4 6  
 5 74

### E Formulas without words (p 56)

- 1 (a) £21 (b) £42 (c) £7  
 2 (a) 540 cm or 5.4 m (b) 700 cm or 7 m  
 (c) 740 cm or 7.4 m  
 3 (a) 200 cm or 2 m (b) 265 cm or 2.65 m  
 (c) 300 cm or 3 m  
 4 (a) 106 cm or 1.06 m (b) 161 cm or 1.61 m

## 32 Estimating and calculating with money

### A Solving problems without a calculator

#### B Estimating answers (p 57)

- 1 (a) (i) £6 (ii) £9 (iii) £10.50 (iv) £6  
 (b) £3  
 (c) £2 cheaper  
 2 (a) £9  
 (b) Less, because a child's ticket is just under £3, so 5 tickets would be just under £15.

#### C Using a calculator (p 57)

- 1 (a) £8.05 (b) £42 (c) £3.84  
 2 (a) 4 (b) £5.80  
 3 95p

### 33 Capacity

**A Litres, millilitres and other metric units** (p 58)

- 1 1.5 litres
- 2 3 litres
- 3 10
- 4 900 ml or 0.9 litres
- 5 250 ml
- 6 2.5 litres
- 7 (a) 6000 ml (b) 15 000 ml (c) 4500 ml (d) 600 ml
- 8 (a) 4 litres (b) 8 litres  
(c) 3.5 litres (d) 1.75 litres
- 9 70 ml, 250 ml,  $\frac{1}{2}$  litre, 1.5 litres, 1700 ml
- 10 (a) metres (b) kilograms  
(c) centimetres (d) litres  
(e) kilometres

- (e) 23 ml
- (f) 6 minutes
- (g)  $12\frac{1}{2}$  or 12.5 ml
- (h) A little over  $7\frac{1}{2}$  or 7.5 minutes

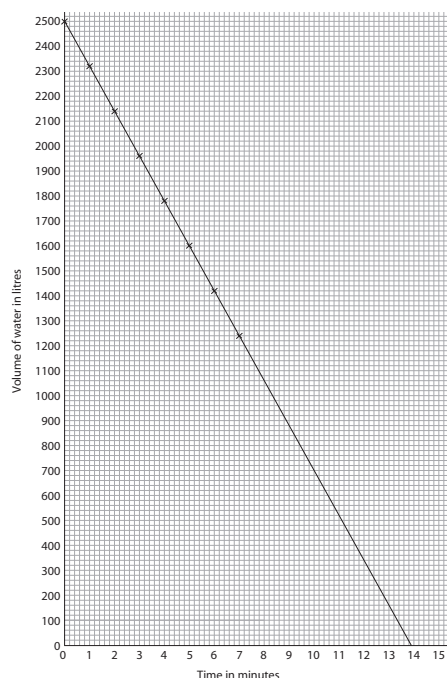
- 2 (a) 2320 litres  
(b) 1600 litres  
(c)

Time in minutes	0	1	2	3	4
Volume of water in litres	2500	<b>2320</b>	<b>2140</b>	<b>1960</b>	<b>1780</b>

5	6	7
<b>1600</b>	<b>1420</b>	<b>1240</b>

(d), (e)



### 34 Drawing and using graphs

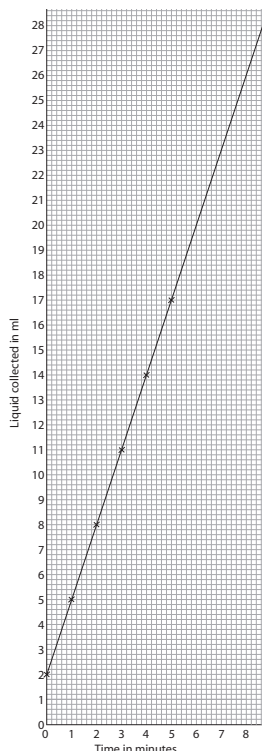
**A Tables and graphs** (p 59)

- 1 (a) 8 ml

(b)

Time in minutes	0	1	2	3	4	5
Liquid collected in ml	2	5	<b>8</b>	<b>11</b>	<b>14</b>	<b>17</b>

(c), (d)



- (f) 700 litres
- (g) 340 litres
- (h) About 11 minutes
- (i) About 14 minutes
- (j) About 10:14 a.m.

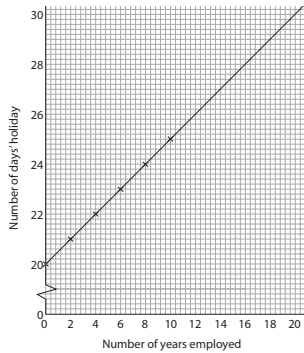
**B Graphs and rules** (p 61)

- 1 (a) 23 days

(b)

No. of years employed	0	2	4	6	8	10
No. of days' holiday	20	<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>

(c), (d)

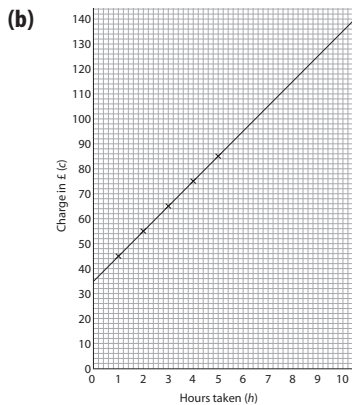


(e) (i) 26 (ii) 28

(f) 18 years

2 (a)

Hours taken (h)	1	2	3	4	5
Charge in £ (c)	45	55	65	75	85



(c) £80

(d)  $8\frac{1}{2}$  hours

## Mixed practice 6 (p 62)

1 400 ml or 0.4 litre

2  $24\text{ cm}^3$

3 (a) 21 (b) 15 (c) 8 (d) 18

4 (a) £105 (b) £225

5 (a) 6 (b) 20p or £0.20

6 20

7 1200 ml

8  $16\text{ cm}^2$

9 12

## 35 Fractions, decimals and percentages

### A Fraction and percentage equivalents (p 63)

1 (a) (i)  $\frac{1}{2}$  (ii) 50%

(b) (i)  $\frac{3}{4}$  (ii) 75%

2  $\frac{1}{10}$  and 10%,  $\frac{3}{4}$  and 75%,  $\frac{1}{2}$  and 50%,  $\frac{1}{4}$  and 25%

3 Tina:  $\frac{1}{4}$  is equivalent to 25% of the bar, which is more than 10%.

4 (a) 10%,  $\frac{1}{4}$ ,  $\frac{3}{4}$ , 100% (b)  $\frac{1}{10}$ ,  $\frac{1}{4}$ , 50%, 75%

### B Fraction and decimal equivalents (p 63)

1 (a) 0.1 (b) 0.3 (c) 0.6 (d) 0.9

2  $\frac{3}{4}$  and 0.75,  $\frac{4}{10}$  and 0.4,  $\frac{2}{10}$  and 0.2,  $\frac{7}{10}$  and 0.7

3 (a) 0.25 litre (b)  $\frac{1}{2}$  litre

4  $\frac{3}{4}$  is bigger; it is equivalent to 0.75.

5 (a)  $\frac{1}{10}$ , 0.25, 0.4,  $\frac{1}{2}$  (b) 0.6,  $\frac{7}{10}$ ,  $\frac{3}{4}$ , 0.9

### C Fraction, decimal and percentage equivalents (p 64)

1

Fraction	Decimal	Percentage
$\frac{3}{4}$	= 0.75	= 75%
$\frac{6}{10}$	= 0.6	= 60%
$\frac{7}{10}$	= 0.7	= 70%
$\frac{4}{10}$	= 0.4	= 40%
$\frac{9}{10}$	= 0.9	= 90%

2 (a) OINL → LION

(b) GTRIE → TIGER

(c) OHNRI → RHINO

(d) ELNPHATE → ELEPHANT

3  $\frac{1}{4}$  is equivalent to 25%, 0.4 is equivalent to 40%.  
So  $\frac{1}{4}$  is closer to 30%.

### D Percentage of a quantity, mentally (p 64)

1 (a) 8 (b) 4 (c) 12 (d) 40

(e) 20 (f) 60

2 (a) 4 (b) 8 (c) 12 (d) 2

(e) 12 (f) 6 (g) 48 (h) 54

(i) 20 (j) 10 (k) 60 (l) 110

3 £540

4 16 g

5 50 g

## 36 Two-way tables

### A Reading tables (p 65)

- 1 (a) 5 hours 25 minutes  
 (b) Plane  
 (c) Train  
 (d) Plane  
 (e) (i) Train (ii) Car

### B Distance tables (p 65)

- 1 (a) 200 miles (b) 100 miles  
 (c) London and Oxford (d) 333 miles  
 2 (a) 120 miles (b) 130 miles (c) 10 miles

## 37 Scale drawings

### A Simple scales (p 66)

- 1 (a) 8 cm (b) 6 cm (c) 2.5 cm (d) 5 cm  
 2 (a) Drawing as required (b) 2.5 cm  
 (c) 5 m (d) 106°  
 (e) 106°  
 3 (a) 1 cm represents 4 cm (b) 3 cm  
 (c) 10 cm  
 4 (a) Scale drawing as required  
 (b) 8.1 cm  
 (c) 8.1 m  
 (d) 31°  
 (e) 79°

### B Harder scales (p 67)

- 1 (a) 50 cm (or half a metre) (b) 3 cm  
 (c) 1.5 m (d) 7.5 cm  
 (e) 3.75 m (f) 8 cm  
 2 (a) 2.5 cm (b) 20 cm (or  $\frac{1}{5}$  metre)  
 (c) 4 cm (d) 1.2 m

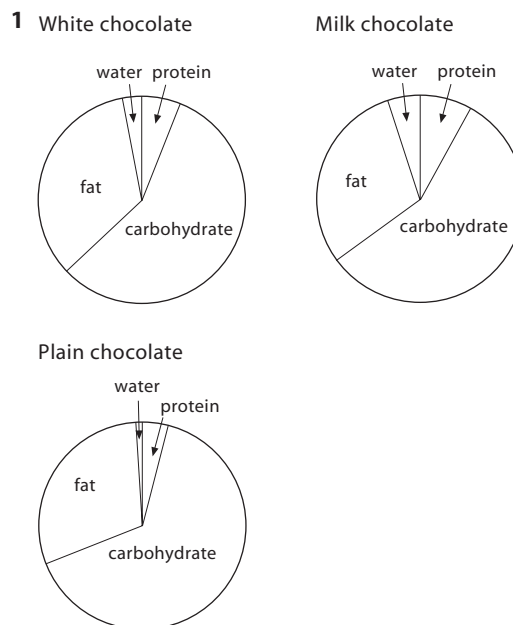
## 38 Using percentages

### A Percentage bars

### B Interpreting pie charts (p 68)

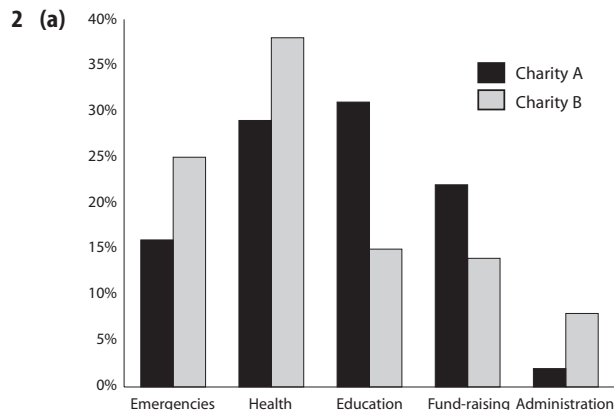
- 1 (a) 60% (b) 22% (c) 7% (d) 5%  
 2 (a) 41% (b) Less (c) 11% (d) 21%  
 3 (a) Photocopying (b) 18%  
 (c) 10% (d) £2000

### C Drawing pie charts (p 69)



### D Comparing (p 69)

- 1 (a) 46%  
 (b) 25%  
 (c) Two differences such as:  
 A higher percentage of males than females were ex-regular smokers.  
 A higher percentage of females than males had never smoked.



- (b) Differences such as:  
 Charity A has lower administration costs.  
 Charity B spends more on health and emergencies than charity A.  
 Charity A spends more on education and fund-raising than charity B.

## 39 Conversion graphs

### A Using a conversion graph (p 70)

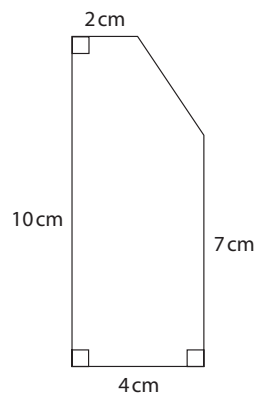
- 1 (a) (i) About 14 square metres  
 (ii) About 26 square metres  
 (iii) About 270 square feet  
 (iv) About 130 square feet  
 (b) Any estimate between 180 and 190 square metres

### B Drawing a conversion graph (p 70)

- 1 (a) A straight line graph through (0, 0) and (25, 700)  
 (b) (i) About 500 ml  
 (ii) About 9 fluid ounces  
 (c) 210 ml

## Mixed practice 7 (p 71)

- 1  $\frac{3}{4}$   
 2 (a) (i) 8 cm (ii) 4 metres  
 (b) 2.5 or  $2\frac{1}{2}$  metres  
 (c) 4 cm  
 3 (a) 24% (b) 14%  
 (c) 4000 to 4500 (54%)  
 4 (a) 6 (b) 12 (c) 16 (d) 15 (e) 50  
 5 (a) 6%  
 (b) (i) False (ii) True  
 6 (a) A full-size drawing with these measurements



- (b) 36 cm  
 7 (a) 9% (b) 1992  
 8 (a) (i) About 70 rand (ii) About £14  
 (b) About £25  
 9 (a) 10%, 0.3, 0.65,  $\frac{3}{4}$  (b) 25%, 0.75, 0.8,  $\frac{9}{10}$