

**Pages 4–5 Multiplying and dividing decimals**

- 1 a** 3400 **b** 0.074  
**2 a** 54.3 **b** 34.7 **c** 0.672 **d** 0.0807  
**3 a** 0.5 **b** 2.3 **c** 0.006 **d** 100  
**4 a** £68.40 **b** £11.90  
**5** £106.72 (1 mark for £26.97 or £79.75)  
**6** £65  
**7 a** 32.2 **b** 5.9 **c** 41.6 **d** 8.3  
**8** £42.80  
**9**  $\frac{1}{5}$  of £46 = £9.20, as  $\frac{1}{8}$  of £73 = £9.125

**Pages 6–7 Long multiplication and division**

Questions worth 2 marks get full marks for a correct answer and 1 mark for correct working with one error. For example  $27 \times 32 = 20 \times 32 + 7 \times 32 = 640 + 214 = 754$  would get 1 mark. (The correct answer is  $640 + 224 = 764$ .)

- 1 a** 864 **b** 7812 **c** 34 **d** 71  
**2 a** 816 **b i** 20 **ii** 40  
**3 a** 1196 **b** 19  
**4 a** 360 **b i** 19 **ii** Yes,  $19 \times 15 = 285$  so 13 left over  
**5 a** £2200 (1 mark for 14700) **b** £1300 (1 mark for 11200) **c** 15  
**6** 19  
**7** 30

**Pages 8–9 Negative numbers**

- 1 a** -2 **b**  $-7 + -6 + -2 = -15$  **c**  $-7 \times 8 = -56$   
**2 a** 68 °F **b** -40 °F **c** -20 °C  
**3 b** < **c** = **d** =  
**4 a** -11 **b** 11 **c** -4 **d** 42  
**5 a** Any valid answer, e.g.  $-3 + -2$  **b** Any valid answer, e.g.  $-7 - -2$   
**6 a** -14 **b** +7 **c** -7, 3  
**7 a** -2 and -6 **b** -7  
**8 a** -1 **b** -4

## Pages 10–11 Adding and subtracting fractions

1 a 17 b 10

2 a  $3\frac{3}{4}$  b  $\frac{20}{7}$

3 a  $\frac{11}{15}$  (1 mark for  $\frac{5}{15}$  or  $\frac{6}{15}$ ) b  $\frac{7}{20}$  (1 mark for  $\frac{12}{20}$  or  $\frac{5}{20}$ )  
c  $\frac{39}{40}$  (1 mark for  $\frac{15}{40}$  or  $\frac{24}{40}$ ) d  $\frac{5}{24}$  (1 mark for  $\frac{21}{24}$  or  $\frac{16}{24}$ )

4 a  $5\frac{9}{20}$  (1 mark for  $\frac{9}{4} + \frac{16}{5}$ ) b  $4\frac{21}{40}$  (1 mark for  $\frac{17}{5} + \frac{9}{8}$ )  
c  $\frac{9}{20}$  (1 mark for  $\frac{21}{5} - \frac{15}{4}$ ) d  $1\frac{5}{12}$  (1 mark for  $\frac{11}{4} - \frac{4}{3}$ )

5 a  $\frac{5}{12}$  (1 mark for  $\frac{20}{48}$ ) b  $\frac{7}{12}$  (1 mark for  $\frac{28}{48}$ )

6 a  $\frac{4}{25}$  b  $\frac{2}{7}$  c  $\frac{6}{25}$  (1 mark for  $\frac{2}{3} \times \frac{9}{25}$ )

## Pages 12–13 Multiplying and dividing fractions

1  $\frac{1}{8}$

2  $\frac{3}{20}$

3 12

4 a  $4\frac{1}{5}$  b  $\frac{19}{6}$

5 a  $\frac{1}{5}$  b  $1\frac{1}{4}$  c  $\frac{2}{7}$  d  $\frac{2}{3}$

6 a  $2\frac{7}{10}$  b  $\frac{2}{3}$  c  $8\frac{1}{4}$  d  $\frac{9}{10}$

7  $3\frac{9}{20}$  cm<sup>2</sup> (1 mark for  $\frac{69}{20}$ )

8 a  $1\frac{3}{8}$  cm<sup>2</sup> (1 mark for  $2\frac{3}{4}$ ) b  $\frac{17}{24}$  cm<sup>2</sup> (1 mark for  $1\frac{5}{12}$ )

9 30 (1 mark for  $\frac{66}{7} \times \frac{5}{11}$ )

10  $1\frac{1}{4}$  cm (1 mark for  $\frac{8}{7} \times \frac{5}{32}$ )

## Pages 14–15 Percentages 1

1 a 14% b Fish cakes c Salad d 6 out of 20 (30%) is more than 6 out of 30 (20%)  
e Fish cakes (10% of each)

2 a £48 b £25.60 c £72 (10% off £80)

3 a South America b 13.3%

4 a 12.5% b 880 acres c Increase. Crops will be 50%, cattle will be  $33\frac{1}{3}\%$  so fallow land will be  $16\frac{2}{3}\%$ . (1 mark for  $330 \div 3 = 110$ )

**Pages 16–17 Percentages 2**

- 1** 45%
- 2 a** 15 **b** 18
- 3 a** 16% **b** 12.5%
- 4** 6 out of 10 = 60%; 40 out of 64 = 62.5%; 32 out of 50 = 64%; 13 out of 20 = 65%  
(1 mark for 3 correct)
- 5** 15% (1 mark for  $\frac{66}{440}$ )
- 6** 9748 (1 mark for  $0.88^{10}$ )
- 7 a** 1504 **b** 975
- 8** £350 (1 mark for  $308 \div 0.88$ )
- 9** 80 g (1 mark for  $92 \div 1.15$ )
- 10** 32% (1 mark for  $1.1 \times 1.2 = 1.32$ )

**Pages 18–19 Ratio**

- 1 a** 2 : 3 **b** 3 : 5
- 2** 800 g (1 mark for 200 g)
- 3** Any seven squares shaded
- 4 a** £18 : £72 (1 mark for  $90 \div 5$ ) **b** 60 kg : 90 kg (1 mark for  $150 \div 5$ )
- 5 a** 175 ml (1 mark for 25 ml) **b** 100 ml (1 mark for 50 ml)
- 6 a** 7 : 3 (1 mark for 28 : 12) **b** 13 : 3 (1 mark for 39 : 9)
- 7 a** Nadia £54.75 Naseem £91.25 **b** Nadia £113.15 Naseem £178.85
- 8 a** 3 : 5 **b** 7 : 12 **c** Small bottle (1 mark for  $3 \div 7$  or  $5 \div 12$ )

## Pages 20–21 Powers and roots

- 1 a 64 b 2187
- 2 a  $4^7$  b  $5^6$
- 3  $25^0, \sqrt[3]{64}, \sqrt{25}, 2^3, 3^2$
- 4 a  $3^3$  b  $4^2$  and  $2^4$
- 5 a 1 (or 0) b Any number between 0 and 1
- 6 a 3 and 4 b 2 and 3
- 7  $a = 6, b = 3, c = 2$
- 8  $m = 2, n = 3$
- 9 a 5 cm b  $150 \text{ cm}^2$
- 10 Any that work, e.g.  $\sqrt{2+3} \approx 2.2, \sqrt{3} + \sqrt{2} \approx 3.1$
- 11 Any that work, e.g.  $\sqrt{(4 \times 9)} = \sqrt{36} = 6, \sqrt{4} \times \sqrt{9} = 2 \times 3 = 6$
- 12  $a = 4, b = 2$  (or vice versa)

## Pages 22–23 Approximations and limits

- 1 a 50 b 0.007

2

Number	Rounded to 1 s.f.	Rounded to 2 s.f.	Rounded to 3 s.f.
5.682	6	5.7	5.68
34 639	30 000	35 000	34 600
0.09938	0.1	0.099	0.0994

- 3 a 149.5 mm b 150.5 mm c 1794 mm
- 4 a 35 g b 45 g c 180 g
- 5 a 100% b 33, 20, 22, 15, 11 c 101%, rounded values not accurate
- 6 a 800 b 16
- 7 a 7.55281818 b 7.6
- 8 7.5 cm, 8.5 cm b 5.5 cm, 6.5 cm c  $41.25 \text{ cm}^2, 55.25 \text{ cm}^2$
- 9  $166.375 \text{ cm}^3$

**Pages 24–25 Standard form**

**1 a**  $8 \times 10^{-6}$  **b**  $6.7 \times 10^{10}$

**2**

Number	Rounded to 1 s.f.	Rounded to 2 s.f.	Rounded to 3 s.f.
0.004578	$5 \times 10^{-3}$	$4.6 \times 10^{-3}$	$4.58 \times 10^{-3}$
34 640 000	$3 \times 10^7$	$3.5 \times 10^7$	$3.46 \times 10^7$
0.00009638	$1 \times 10^{-4}$	$9.6 \times 10^{-5}$	$9.64 \times 10^{-5}$

**3 a** 680 000 **b** 0.00089 **c** 985 000 000

**4 a**  $3.45 \times 10^7$  **b**  $7 \times 10^4$  **c**  $2.1 \times 10^9$  **d**  $8.4 \times 10^3$

**5 a**  $8 \times 10^6$  **b**  $1 \times 10^{-3}$  **c**  $1.6 \times 10^4$

**6 a**  $1.1 \times 10^{12} \text{ km}^3$  (1 mark for 109...) **b**  $3.6 \times 10^8 \text{ km}^2$  (1 mark for 3603...)

**7**  $1.2 \times 10^{-10} \text{ m}$

**8 a**  $3.53 \times 10^{-2} \text{ cm}$  **b**  $1.24 \times 10^{-3} \text{ cm}^2$  **c**  $597.4 \text{ cm}^2$  (595.2 using rounded value in **b**)