Learner' book

Exercise 3.2

1 a C b A

c B d C

2 a 240 b 0.24 c 24

d 0.0024 e 2400 f 2.4

3 a learners' answers

Example: In **a** he has forgotten the zeros. It should be 45 000. In **b** he has rounded to 2 d.p. not 2 s.f. It should be 0.033.

b learners' answers

Example: Fill in the gaps between the significant figures and the decimal point with zeros.

c learners' answers

Example: Fill in the gaps between the decimal point and the significant figures with zeros.

4 a 100 b 46 000 c 18.7

d 0.09 e 0.79 f 1.409

g 1000 h 0.70 i 8.60

5 **a** D **b** C

c B **d** D

e C

6 **a** 200 **b** 210 **c** 209

d 209.1 **e** 209.10 **f** 209.095

7 **a** 683.615 77 31

b **i** 700 **ii** 680

iii 684 **iv** 683.6

v 683.62 **vi** 683.616

8 96 000

9 0.4 g

10 298 000 000 metres per second

11 learners' answers, but convention is that answers are usually given to the same accuracy as the numbers in the question. So Sofia is correct.

12 12 600 × \$26.80 = \$337 680 which is \$338 000 to 3 s.f.

13 $a = 2.1$ to 2 s.f.

14 **a** **i** 16 **ii** 16.1 (3 s.f.)

b **i** 700 **ii** 713 (3 s.f.)

c **i** 40 **ii** 42.6 (3 s.f.)

d **i** 80 **ii** 67.2 (3 s.f.)

Exercise 4.1

1 a 2.06, 5.49, 5.91, 7.99

b 2.55, 2.87, 3.09, 3.11

c 11.82, 11.88, 12.01, 12.1

d 8.9, 9.09, 9.4, 9.53

2 a $4.23 < 4.54$ b $6.71 > 6.03$

c $0.27 > 0.03$ d $27.9 > 27.85$

e $8.55 > 8.508$ f $5.055 < 5.505$

3 learners' answers

4 a 23.592, 23.6, 23.605, 23.66

b 0.009, 0.08, 0.1, 0.107

c 6.007, 6.71, 6.725, 6.78

d 11.002, 11.02, 11.032, 11.1

5 a $6.71 \neq 670\,\text{ml}$

b $4.05\,\text{t} \neq 4500\,\text{kg}$

c $0.85\,\text{km} = 850\,\text{m}$

d $0.985\,\text{m} \neq 985\,\text{cm}$

e $14.5\,\text{cm} = 145\,\text{mm}$

f $2300\,\text{g} \neq 0.23\,\text{kg}$

6 a $4.51 > 2700\,\text{ml}$

b $0.45\,\text{t} < 547\,\text{kg}$

c $3.5\,\text{cm} < 345\,\text{mm}$

d $0.06\,\text{kg} < 550\,\text{g}$

e $7800\,\text{m} > 0.8\,\text{km}$

f $0.065\,\text{m} < 6.7\,\text{cm}$

7 a 780 g, 1950 g, 2.18 kg, 2.3 kg

b 0.8 cm, 9 mm, 12 mm, 5.4 cm

c 0.5 m, 53 cm, 650 cm, 12 m

d 95 ml, 450 ml, 0.55 l, 0.9 l

e 780 m, 1450 m, 6.4 km, 6.55 km

f 50 kg, 0.08 t, 0.15 t, 920 kg

8 a No, his list starts with the largest and ends with the smallest.

It should be −4.52, −4.38, −4.31, −4.05

b learners' answers

9 a $-4.27 > -4.38$ b $-6.75 < -6.25$

c $-0.2 < -0.03$ d $-8.05 > -8.9$

10 a −4.76, −4.67, −4.5, −4.05

b −11.91, −11.6, −11.525, −11.08,

11 a 25 km. It is much further than the other distances.

b Mia is correct.

1.64 km = longest, 0.2 km = shortest, 8×0.2 km = 1.6 km and 1.64 km > 1.6 km

c Shen swims in the 25 m pool as all his distances are multiples of 25 m.

Mia swims in the 20 m pool as all her distances are multiples of 20 m.

12 a A 2.5, B 2.4, C 2.3, D 2.1, E 2.25, F 2.45

b 2.1, 2.25, 2.3, 2.4, 2.45, 2.5

13 No, there are 7 numbers not 8. x could be: 3.27, 3.28, 3.29, 3.30, 3.31, 3.32, 3.33

14 y could be: −0.273, −0.272, −0.271, −0.270

Exercise 4.2

1 a −0.8 b 0.6 c −2.1

d 5.6 e −3.6

2 a −0.18 b −1.8

c −0.018 d −18

3 C −7.65, E −7.28, A −7.2, D −7.04, B −7.02

4 learners' answers

5 a i $2 \times 4 = 8$

$0.2 \times 4 = 0.8$

$0.2 \times 0.4 = 0.08$

$0.2 \times 0.04 = 0.008$

$0.2 \times 0.004 = 0.0008$

ii $3 \times 5 = 15$

$0.3 \times 5 = 1.5$

$0.3 \times 0.5 = 0.15$

$0.3 \times 0.05 = 0.015$

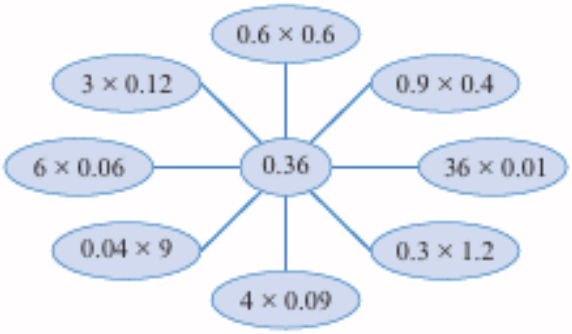
$0.3 \times 0.005 = 0.0015$

b i 0.009 ii 0.48

iii 0.028 iv 0.0015

v 0.036 vi 0.0066

6



7 a i 365.4 ii 36.54

iii 365.4 iv 36.54

b, c learners' answers

8 a $158 \times 46 = 7268$

b i 726.8 ii 726.8

iii 72.68 iv 7.268

v 7.268 vi 0.07268

9 learners' answers

10 a 62.98 Estimate: $7 \times 9 = 63$

b 4.648 Estimate: $0.6 \times 8 = 4.8$

c 1.8745 Estimate: $0.2 \times 8 = 1.6$

d 0.17526 Estimate: $0.7 \times 0.3 = 0.21$

11 a Estimate: $0.5 \times 3 = 1.5$. Her answer of 12.6 must be wrong.

b Estimate: $8 \times 0.009 = 0.072$. Her answer of 0.07254 could be correct.

c Estimate: $0.07 \times 0.04 = 0.0028$. Her answer of 0.02795 must be wrong.

12 a $6 \times 7 = 42$ mg b 42.34 mg

13 a $1 \times 4 = 4$ g b 3.255 g

Exercise 4.3

1 **a** $\frac{24}{4} = 6$ **b** $\frac{72}{9} = 8$

c $-\frac{420}{6} = -70$ **d** $-\frac{450}{5} = -90$

2 D because the answer is 8. All the others have an answer of 7.

3 learners' answers

4 **a** 2.3 **b** 8.2

c −860 **d** −960

5 $1.35 per metre

6 learners' answers

7 **a** Estimate: $30 \div 0.3 = 100$
Accurate: $27.6 \div 0.3 = 92$

b Estimate: $-200 \div 0.4 = -500$
Accurate: $-232 \div 0.4 = -580$

c Estimate: $300 \div 1 = 300$
Accurate: $306 \div 0.9 = 340$

d Estimate: $-490 \div 0.7 = -700$
Accurate: $-483 \div 0.7 = 690$

e Estimate: $40 \div 0.8 = 50$
Accurate: $43.76 \div 0.8 = 54.7$

f Estimate: $-30\,000 \div 0.6 = -50\,000$
Accurate: $-33\,972 \div 0.6 = -56\,620$

8 **a** She hasn't written down the 0 above the 6.

b 42.05

9 **a** Carried on the division by writing a decimal point after the 7, then carrying the remainder of 9 onto the zero in the tenths column.

b 256.5

10 **a**

1	2	3	4	5	6	7	8	9
19	38	57	76	95	114	133	152	171

b 31.25 **c** $30 \times 2 = 60$

11 **a**

1	2	3	4	5	6	7	8	9
25	50	75	100	125	150	175	200	225

b $23.56

c $23.56 ≈ 20 and $20 \times 2.5 = 50

12 14.75 m

13 **a** **i** 425 **ii** 27

iii 4250 **iv** 270

b learners' answers

c **i** 425 **ii** 42.5

iii 4.25 **iv** 0.425

d learners' answers

e peer discussion

14 **a** 6.3 **b** 74.86 **c** −2473.5

Exercise 7.1

1 **a** $\frac{1}{2} = 0.5$ Terminating decimal

b $\frac{1}{3} = 0.\dot{3}$ Recurring decimal

c $\frac{1}{4} = 0.25$ Terminating decimal

d $\frac{1}{5} = 0.2$ Terminating decimal

e $\frac{1}{6} = 0.1\dot{6}$ Recurring decimal

f $\frac{1}{7} = 0.\dot{1}42857\dot{}$ Recurring decimal

g $\frac{1}{8} = 0.125$ Terminating decimal

h $\frac{1}{9} = 0.\dot{1}$ Recurring decimal

i $\frac{1}{10} = 0.1$ Terminating decimal

j $\frac{1}{11} = 0.\dot{0}\dot{9}$ Recurring decimal

k $\frac{1}{12} = 0.08\dot{3}$ Recurring decimal

2 a

Unit fraction	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{4}$	$\frac{1}{5}$	$\frac{1}{6}$	$\frac{1}{7}$	$\frac{1}{8}$	$\frac{1}{9}$	$\frac{1}{10}$	$\frac{1}{11}$	$\frac{1}{12}$
Decimal	0.5	$0.\dot{3}$	0.25	0.2	$0.1\dot{6}$	$0.\dot{1}42857\dot{}$	0.125	$0.\dot{1}$	0.1	$0.\dot{0}\dot{9}$	$0.08\dot{3}$
Terminating (T) or recurring (R)	T	R	T	T	R	R	T	R	T	R	R

b i Zara is correct. $\frac{1}{16} = 0.0625$ and $\frac{1}{32} = 0.03125$.

Half of 0.5 is 0.25. From now on every halving means halving a decimal number with 25 on the end. Half of 25 is 12.5, so the final two digits of each fraction after 0.5 will always end in 25.

ii learners' answers

For example: All the fractions with a denominator which is a multiple of 3 are recurring decimals.

For example: The fractions with denominator 5, 10, 20, 40 (i.e. doubling each time) are terminating decimals. $\frac{1}{5} = 0.2$, $\frac{1}{10} = 0.1$, $\frac{1}{20} = 0.05$, $\frac{1}{40} = 0.025$, $\frac{1}{80} = 0.0125$

iii peer discussion

3 a learners' answers

For example: Terminating, because all the denominators are factors of 100.

b A $\frac{5}{8} = 0.625$, B $\frac{3}{4} = 0.75$,

C $\frac{7}{10} = 0.7$, D $\frac{11}{20} = 0.55$,

E $\frac{3}{5} = 0.6$

c D, E, A, C, B

4 a learners' answers

For example, recurring, because all the denominators are multiples of 3.

b A $\frac{5}{6} = 0.8\dot{3}$, B $\frac{2}{3} = 0.\dot{6}$,

C $\frac{7}{12} = 0.58\dot{3}$, D $\frac{5}{9} = 0.\dot{5}$,

E $\frac{3}{11} = 0.\dot{2}\dot{7}$

c E, D, C, B, A

5 a learners' answers

For example: It's rounded the last 8 on the screen to a 9.

b $\frac{8}{9}$ 0.888888889 $\frac{1}{9}$ 0.111111111

$\frac{11}{15}$ 0.733333333 $\frac{7}{18}$ 0.388888889

c learners' answers

For example: Changes the fraction to a decimal.

learners' answers

For example: Changes the decimal back to a fraction.

d i $\frac{7}{15} = 0.46\dot{6}$ ii $\frac{8}{11} = 0.\dot{7}\dot{2}$

6 a $\frac{7}{9} = 0.\dot{7}$ b $\frac{13}{20} = 0.65$

c $\frac{2}{15} = 0.1\dot{3}$ d $\frac{9}{40} = 0.225$

7 learners' answers

For example: The last two the digits are the same as the first two, so it must be repeating.

8 a $\frac{2}{7} = 0.\dot{2}85714\dot{}$ b $\frac{9}{13} = 0.\dot{6}92307\dot{}$

c $\frac{11}{14} = 0.7\dot{8}5714\dot{2}$

9 a, b i $\frac{5}{12} = 0.41\dot{6}$ is correct

ii $\frac{10}{11} = 0.\dot{9}0$ is wrong as the recurring dot should be over the 9 and the 0, so $0.\dot{9}\dot{0}$

iii $\frac{6}{7} = 0.8\dot{5}7142\dot{}$ is wrong as the recurring dot should be over the 8 at the start, not the 5, so $0.\dot{8}57142\dot{}$

iv $\frac{1}{37} = 0.0\dot{2}\dot{7}$ is wrong as the recurring dot should be over the 0 at the start, not the 2, so $0.\dot{0}2\dot{7}$

10 a $\frac{4}{3} = 1.\dot{3}$ b $\frac{13}{6} = 2.1\dot{6}$

c $\frac{19}{9} = 2.\dot{1}$ d $\frac{45}{11} = 4.\dot{0}\dot{9}$

11 **a** $4.\dot{3}$ **b** $1.\dot{6}$

c $6.1\dot{6}$ **d** $3.8\dot{3}$

12 $\frac{8}{52} = 0.\dot{1}53846\dot{}$

13 Yes. Both $\frac{1}{15}$ and $\frac{4}{15}$ have one number that is recurring and both $\frac{1}{22}$ and $\frac{7}{22}$ have two recurring decimals.

Workbook

Exercise 3.2

1 a 200 b 5000

c 20000 d 200 000

2 a 210 b 4800

c 24000 d 190 000

3 a 4730 b 66 500 c 2 360 000

4 a 0.02 b 0.006

c 0.00004 d 0.7

5 a 0.023 b 0.0057

c 0.000038 d 0.69

6 a **C** 500 b **B** 9

c **A** 6000 d **C** 0.004

7 a 360 b 0.36 c 3600

d 0.0036 e 36 f 3.6

8 a Part a: he has forgotten to add the extra zeros. Part b: he has rounded to 3 d.p. not 3 s.f.

b Part a: 2 370 000 Part b: 0.002 06

9 a 2000 b 760 c 5.37

d 0.08 e 0.20 f 6.04

g 1000 h 0.90 i 20.0

10 a **D** 600 b **A** 15 c **C** 0.0789

d **D** 0.007 778 e **A** 0.040

11 a 762.204 903

b i 800 ii 760 iii 762

iv 762.2 v 762.20 vi 762.205

12 2700 km

13 **a** 500 **b** 530 **c** 530
d 530.4 **e** 530.40 **f** 530.404

14 0.0259 g

15 200 000

16 1 100 000 (2 s.f.)

17 0.053 (2 s.f.)

18 **a** **i** 120 **ii** 119
b **i** 400 **ii** 401
c **i** 12 000 **ii** 12 600
d **i** 80 **ii** 83.6
e **i** 1000 **ii** 962
f **i** 3 **ii** 2.89
g **i** 25 **ii** 18.6
h **i** 4 **ii** 5.19
i **i** 20 **ii** 17.2

Exercise 4.1

1 51, 08, 21, 17

08, 17, 21, 51

5.08, 5.17, 5.21, 5.51

2 **a** 29 16 95 91
16 29 91 95
4.16 4.29 4.91 4.95
b 94 49 95 47
47 49 94 95
8.47 8.49 8.94 8.95
c 19 15 13 01
01 13 15 19
0.01 0.13 0.15 0.19

3 **a** $7.27 > 7.23$ **b** $9.71 < 9.83$
c $20.17 > 20.09$ **d** $3.9 > 3.65$

4 **a** $-5.2 > -5.7$ **b** $-6.5 < -6.2$
c $-7.2 > -7.5$ **d** $-8.8 > -8.9$

5 **a** 3.5 g > 380 mg
b 0.4 t < 845 kg
c 2.5 cm < 48 mm
d 950 g > 0.08 kg
e 2500 m > 1.9 km
f 250 cm < 6.5 m

6 **a** 45.399, 45.454, 45.545, 45.933
b 5.009, 5.044, 5.077, 5.183
c 31.14, 31.148, 31.41, 31.425
d 7.02, 7.052, 7.2, 7.502

7 **a** 205.5 cm ≠ 255 mm **b** 0.125 g = 125 mg
c 500 g ≠ 0.05 kg **d** 10.5 t ≠ 1050 kg
e 0.22 kg = 220 g **f** 1.75 km ≠ 175 m

8 **a** 9.1 > 9.03
b 56.4 > 56.35
c 0.66 > 0.606
d 3.505 < 3.7
e 0.77 t < 806 kg
f 7800 m > 0.8 km
g 3.5 kg > 375 g
h 156.3 cm > 1234 mm

9 **a** 0.2 cm, 7 mm, 27 mm, 4.3 cm
b 19.5 mm, 29 cm, 34.5 cm, 500 mm
c 2000 g, 3 kg, 5550 g, 75.75 kg
d 0.9 kg, 1.75 kg, 1800 g, 1975 g
e 100 mg, 0.125 g, 150 mg, 0.2 g
f 0.05 km, 999 m, 2750 m, 25 km

10 **a** $-2.3 > -2.4$ **b** $-7.23 > -7.29$
c $-0.15 < -0.08$ **d** $-11.02 > -11.5$

11 **a** −8.8, −8.34, −8.28, −8.06
b −1.78, −1.5, −1.425, −1.03

12 **a** 32 km as it is a lot more than the other numbers.
b Sarina is wrong. Longest distance = 4 km, shortest distance = 0.5 km
$0.5 \times 10 = 5$ km which is > 4 km, not < 4 km

c Sarina runs in the 250 m park as her distances are all multiples of 250 m.

Frank runs in the 400 m park as his distances are all multiples of 400 m.

13 a **A** −6.9, **B** −6.84, **C** −6.95

b C −6.95, A −6.9, B −6.84

14 −1.43, −1.42, −1.41, −1.40, −1.39

15 a $F = -37.48$ when $C = -38.6$

b −38.6 °F is colder, because −38.6 °C = −37.48 °F which is warmer than −38.6 °F

Exercise 4.2

1 a × 0.4 is the same as +10 and × 4 OR × 4 and +10

b × 0.6 is the same as +10 and × 6 OR × 6 and +10

2 a $30 \div 10 = 3$ and $3 \times 2 = 6$

b $-40 \div 10 = -4$ and $-4 \times 2 = -8$

c $12 \times 2 = 24$ and $24 \div 10 = 2.4$

d $-8 \times 2 = -16$ and $-16 \div 10 = -1.6$

3 a $30 \div 10 = 3$ and $3 \times 3 = 9$

b $-50 \div 10 = -5$ and $-5 \times 3 = -15$

c $15 \times 3 = 45$ and $45 \div 10 = 4.5$

d $-9 \times 3 = -27$ and $-27 \div 10 = -2.7$

4 a $500 \div 100 = 5$ and $5 \times 2 = 10$

b $-600 \div 100 = -6$ and $-6 \times 2 = -12$

c $25 \times 2 = 50$ and $50 \div 100 = 0.5$

d $-4 \times 2 = -8$ and $-8 \div 100 = -0.08$

5 a $500 \div 100 = 5$ and $5 \times 3 = 15$

b $-700 \div 100 = -7$ and $-7 \times 3 = -21$

c $12 \times 3 = 36$ and $36 \div 100 = 0.36$

d $-3 \times 3 = -9$ and $-9 \div 100 = -0.09$

6 a −0.9 b 1.5 c −6 d 4.2

e −7.2

7 a −0.24 b −2.4

c −0.024 d −24

8 **E** −13.5, **D** −13, **C** −12.9, **B** −12.6, **A** −12.48

9 a i $3 \times 3 = 9$

$0.3 \times 3 = 0.9$

$0.3 \times 0.3 = 0.09$

$0.3 \times 0.03 = 0.009$

$0.3 \times 0.003 = 0.0009$

ii $4 \times 7 = 28$

$0.4 \times 7 = 2.8$

$0.4 \times 0.7 = 0.28$

$0.4 \times 0.07 = 0.028$

$0.4 \times 0.007 = 0.0028$

b i 0.005 ii 0.24 iii 0.024

iv 0.0016 v 0.048 vi 0.006

10 a Equal to 0.0012 are: **A**, **G**, **H**

Equal to 0.016 are: **B**, **E**, **I**

Equal to 0.0018 are: **C**, **D**, **J**

F is left over. $0.05 \times 0.4 = 0.02$

b Learners' answers. Any calculation that gives an answer of 0.02, e.g. 0.2×0.1

11 a 13 104

b i 1310.4 ii 1310.4

iii 131.04 iv 13.104

v 13.104 vi 0.131 04

12 a Estimate: $7 \times 8 = 56$, Accurate: 59.76

b Estimate: $0.2 \times 5 = 1$, Accurate: 1.08

c Estimate: $0.9 \times 6 = 5.4$, Accurate: 5.5245

d Estimate: $0.6 \times 0.7 = 0.42$, Accurate: 0.452 62

13 a Estimate = $0.2 \times 7 = 1.4$, so 1.587 could be correct

b Estimate: $80 \times 0.003 = 0.24$ so 0.0246 is incorrect

c Estimate: $0.08 \times 0.005 = 0.0004$, so 0.0039 is incorrect

14 a Estimate: 30 × 2 = 60 ml

b 75 ml

15 a Estimate: 33 × 0.03 = 0.99 litres

b 0.975 litres

16 **a** **i** $F = 5$ when $C = -15$

ii $F = -4$ when $C = -20$

b Marcus is not correct. When $C = -17$, $F = 1.4$. The closest to zero is when $C = -18$ and $F = -0.4$ because -0.4 is closer to zero than 1.4

Exercise 4.3

1 **a** $1.6 \div 0.4 = \frac{1.6}{0.4}$, $\frac{1.6 \times 10}{0.4 \times 10} = \frac{16}{4} = 4$

b $4.5 \div 0.9 = \frac{4.5}{0.9}$, $\frac{4.5 \times 10}{0.9 \times 10} = \frac{45}{9} = 5$

c $-24 \div 0.3 = \frac{-24}{0.3}$, $\frac{-24 \times 10}{0.3 \times 10} = \frac{-240}{3} = -80$

d $-21 \div 0.7 = \frac{-21}{0.7}$, $\frac{-21 \times 10}{0.7 \times 10} = \frac{-210}{7} = -30$

2 **A** and **iii**, **B** and **i**, **C** and **v**, **D** and **ii**, **E** and **iv**

3 **a** $2 \div 0.4 = \frac{2}{0.4}$, $\frac{2 \times 10}{0.4 \times 10} = \frac{20}{4} = 5$

b $3 \div 0.5 = \frac{3}{0.5}$, $\frac{3 \times 10}{0.5 \times 10} = \frac{30}{5} = 6$

c $-6 \div 0.2 = \frac{-6}{0.2}$, $\frac{-6 \times 10}{0.2 \times 10} = \frac{-60}{2} = -30$

d $-4 \div 0.8 = \frac{-4}{0.8}$, $\frac{-4 \times 10}{0.8 \times 10} = \frac{-40}{8} = -5$

4 **a** She has not multiplied the 40 by 10

b 80

5 **C** is the odd one out as the answer is 110. All the others have an answer of 120.

6 **a** 2.6 **b** 16.4 **c** -1230 **d** -270

7 \$4.30

8 **a** **i** Estimate: $51 \div 0.3 = 170$

ii Accurate: 165

b **i** Estimate: $-900 \div 0.4 = -2250$

ii Accurate: -2340

c **i** Estimate: $30 \div 0.5 = 60$

ii Accurate: 63

d **i** Estimate: $-360 \div 0.6 = -600$

ii Accurate: -585

e **i** Estimate: $56 \div 0.7 = 80$

ii Accurate: 84.2

f **i** Estimate: $-4000 \div 0.8 = -5000$

ii Accurate: -4760

9 **a**

1	2	3	4	5	6	7	8	9
13	26	39	52	65	78	91	104	117

b 58.1 **c** $60 \times 13 = 780$

10 **a**

1	2	3	4	5	6	7	8	9
19	38	57	76	95	114	133	152	171

b \$24.80

c $\$25 \times 2 = \$50$

11 **a** **i** 654 **ii** 32

iii 6540 **iv** 320

b learners' answers

c **i** 654 **ii** 65.4

iii 6.54 **iv** 0.654

d learners' answers

12 **a** 4.2 (1 d.p.) **b** 59.18 (2 d.p.)

c -3043.889 (3 d.p.)

13 **a** learners' own proof, e.g. $0.5 \times 5.2 \times 3.64 = 2.6 \times 3.64 = 9.464\,m^2$ and $9.464\,m^2 \neq 8.84\,m^2$

b height = 3.4 m

14 2.4 m

15 **a** No. Learners' explanations, e.g. $7.2 \times 0.8 = 5.76$ and $5.76 \neq 8.64$

b term-to-term rule is: multiply by 1.2, 1st term = 6, 4th term = 10.368; learners' explanations

Exercise 7.1

1 $\frac{1}{2} = 0.5$ terminating, $\frac{1}{3} = 0.\dot{3}$ recurring,
$\frac{1}{4} = 0.25$ terminating, $\frac{1}{5} = 0.2$ terminating,
$\frac{1}{6} = 0.1\dot{6}$ recurring, $\frac{1}{7} = 0.\dot{1}42857\dot{}$ recurring,
$\frac{1}{8} = 0.125$ terminating, $\frac{1}{9} = 0.\dot{1}$ recurring,
$\frac{1}{10} = 0.1$ terminating

2 **a** $\frac{2}{5} = 0.4$ terminating

b $\frac{2}{3} = 0.\dot{6}$ recurring

c $\frac{3}{4} = 0.75$ terminating

d $\frac{3}{5} = 0.6$ terminating

e $\frac{5}{6} = 0.8\dot{3}$ recurring

f $\frac{2}{7} = 0.\dot{2}85714\dot{}$ recurring

g $\frac{3}{8} = 0.375$ terminating

h $\frac{4}{9} = 0.\dot{4}$ recurring

i $\frac{7}{10} = 0.7$ terminating

j $\frac{2}{11} = 0.\dot{1}\dot{8}$ recurring

3 $\frac{2}{11}, \frac{3}{8}, \frac{4}{9}, \frac{3}{5}, \frac{7}{10}$

a terminating, with learners' explanations

b $\frac{7}{8} = 0.875$, $\frac{4}{5} = 0.8$, $\frac{3}{10} = 0.3$, $\frac{3}{20} = 0.15$, $\frac{8}{25} = 0.32$

c $\frac{3}{20}, \frac{3}{10}, \frac{8}{25}, \frac{4}{5}, \frac{7}{8}$

a recurring, with learners' explanations

b $\frac{5}{9} = 0.\dot{5}$, $\frac{1}{3} = 0.\dot{3}$, $\frac{5}{12} = 0.41\dot{6}$, $\frac{4}{11} = 0.\dot{3}\dot{6}$, $\frac{8}{15} = 0.5\dot{3}$

c $\frac{1}{3}, \frac{4}{11}, \frac{5}{12}, \frac{8}{15}, \frac{5}{9}$

4 Marcus is incorrect.

learners' explanations, e.g. $\frac{3}{6} = \frac{1}{2} = 0.5$
which is a terminating decimal

7 **a** $0.\dot{8}$ **b** 0.85

c $0.2\dot{6}$ **d** 0.675

8 **a** $0.\dot{8}57\,14\dot{2}$ **b** $0.\dot{8}46\,153\dot{}$

c $0.\dot{2}38095\dot{}$

9 **i** is correct

ii is incorrect: there should be a dot over the 7 as well as the 2, i.e. $0.\dot{7}\dot{2}$

iii is incorrect: she has written the numbers in the wrong order; the correct answer is $0.6\dot{1}$

iv is incorrect: the second dot should be over the 5, not the 1, i.e. $0.\dot{1}28\,20\dot{5}$

10 learners' explanations, e.g. She is wrong.
It is a recurring decimal but the calculator has rounded up the final digit on the screen.
$\frac{7}{9} = 0.\dot{7}$

11 $\frac{5}{27} = 0.\dot{1}8\dot{5}$

12 $0.5, \frac{7}{13}, 55\%, 0.56, \frac{4}{7}, 58.2\%, 0.6, \frac{18}{27}$

13 **a** $1.\dot{6}$ **b** 3.25

c $3.\dot{2}$ **d** 4.375

14 **a** **i** $3\frac{1}{2}$ hours **ii** 3.5 hours

b i $2\frac{3}{4}$ hours ii 2.75 hours

c i $1\frac{1}{6}$ hours ii $1.1\dot{6}$ hours

d i $4\frac{1}{3}$ hours ii $4.\dot{3}$ hours

e i $9\frac{1}{5}$ hours ii 9.2 hours

f i $11\frac{5}{12}$ hours ii $11.41\dot{6}$ hours

15 learners' explanations, e.g. Arun is wrong and his teacher is correct. The 6 in 0.006 has a recurring dot, so it is 0.0066666 . . . not 0.006 which is what Arun has used. When you double 0.006 you get 0.012, but when you double 0.0066666 . . . you do get 0.013333 . . .