

# › Learner's Book answers

## Unit 1 The number system

### Getting started

1 a 9 ones  
c 9 tenths

2 a two hundred and five thousand, four hundred and eight point nine  
b five hundred and seventy thousand and thirty six point zero one

3 a 0.1  
b 5.55

4 10

5 a 6m  
c 12m

6 a 99.5  
b 10.4

### Exercise 1.1

1 a 7 hundred  
c 7 tenths

2 2.046

3 Odd one out is 12.34. All the others are equivalent to 1.234.

4 a two point one three nine  
b negative nine hundred and nine point nine zero nine

c twenty-five point four three one

d negative three point four eight one

5 0.8 or  $\frac{8}{10}$  and 0.004 or  $\frac{4}{1000}$

6 a 0.14  
b 0.019

7 a 7200  
d 6.7

8 a C  
b D  
c E  
9 5

### Think like a mathematician

98 889 petals left ( $100\ 000 - 1111 = 98\ 889$ )

### Exercise 1.2

1 4 8 3 7

2 \$15

3 4.5 5.05 4.55 5.35

4 4.5 7.8 2.4 9.1

5 7.51 7.49 7.53

6 A False, 3.04 is 3.0 when rounded to the nearest tenth.

B True

C False, 6.95 is 7.0 when rounded to the nearest tenth.

7 55.6 litres 12.2 metres 35.5 kilograms

8 0.5

9 7.97 is 8 when rounded to the nearest whole number.

7.97 is 8.0 when rounded to the nearest tenth.

The 7 in the hundredths place increases the tenths by one so 7.9 becomes 8.0. If the number is rounded to the nearest tenth, there must be a digit in the tenths place, even if it is zero.

### Think like a mathematician

5 cm is between 4.50 and 5.49 cm

6 cm is between 5.50 and 6.49 cm

Smallest possible perimeter =  $4.50 + 4.50 + 5.50 + 5.50 = 20.00$  cm

Largest possible perimeter =  $5.49 + 5.49 + 6.49 + 6.49 = 23.96$  cm

## Check your progress

**1**  $0.6 + 0.05 + 0.005$

**2** 97,314

**3** 1000

**4** **a** 3.1 **b** 10

**5** **a** 10 **b** 100

**c** 1000 **d** 0.034

**6** 13.94 seconds

# Unit 8 Addition and subtraction (2)

## Getting started

1 5 tenths

2 13.13

3 0.2 metres

4 a 98.73      b 7.55

5 a  $\frac{7}{5}$       b  $\frac{4}{8} = \frac{1}{2}$       c  $\frac{5}{10} = \frac{1}{2}$

6  $\frac{5}{6}$

## Exercise 8.1

1 D

2 0.8 or  $\frac{8}{10}$  and 0.004 or  $\frac{4}{1000}$

3 0.88 and 0.12

4  $5.05 + 5.115 = 10.165$

5 a 20.478      b 30.864      c 76.934

    d 29.46      e 15.853      f 20.614

6 Ahmed should make sure the decimals have the same number of decimal places, then write down the calculation in columns.

0	7	0
+	0	4
	1	1

7 0.171

8 18.95 kg

9 \$191.27

10 0.066 kg

## Think like a mathematician

$1.604 + 2.375 = 3.979$  and  $3.476 - 2.501 = 0.975$  or  $3.501 - 2.476 = 1.025$

## Think like a mathematician 1

Both fractions are almost a half. Both are a half of a fraction away from a half. Since sevenths are bigger than ninths, the fraction with ninths is closer to a half, so  $\frac{4}{9}$  must be bigger.

## Exercise 8.2

1	Calculation	Common denominator	Equivalent calculation	Answer
	$\frac{1}{3} + \frac{1}{6}$	6	$\frac{2}{6} + \frac{1}{6}$	$\frac{3}{6} = \frac{1}{2}$
	$\frac{7}{10} - \frac{1}{2}$	10	$\frac{7}{10} - \frac{5}{10}$	$\frac{2}{10} = \frac{1}{5}$
	$\frac{6}{5} + \frac{1}{2}$	10	$\frac{12}{10} + \frac{5}{10}$	$\frac{17}{10} = 1\frac{7}{10}$

2 a  $\frac{23}{20} = 1\frac{3}{20}$

b  $\frac{7}{24}$

c  $\frac{59}{40} = 1\frac{19}{40}$

3  $\frac{19}{20}$  and  $\frac{31}{12} = 2\frac{7}{12}$

4 They are both correct because  $\frac{19}{15} = 1\frac{4}{15}$

5 a  $\frac{23}{10} = 2\frac{3}{10}$

b  $\frac{53}{12} = 4\frac{5}{12}$

c  $\frac{43}{24} = 1\frac{19}{24}$

6 a  $\frac{19}{10} = 1\frac{9}{10}$

b  $\frac{13}{12} = 1\frac{1}{12}$

c  $\frac{28}{15} = 1\frac{13}{15}$

7  $\frac{7}{12}$

8  $\frac{1}{36}$

9  $\frac{1}{12}$

## Think like a mathematician 2

$\frac{1}{5} + \frac{1}{2} = \frac{7}{10}$	$\frac{1}{5} + \frac{1}{3} = \frac{8}{15}$	$\frac{1}{5} + \frac{1}{4} = \frac{9}{20}$	$\frac{1}{5} + \frac{1}{5} = \frac{10}{25}$	$\frac{1}{5} + \frac{1}{6} = \frac{11}{30}$	$\frac{1}{5} + \frac{1}{7} = \frac{12}{35}$
$\frac{1}{7} + \frac{1}{2} = \frac{9}{14}$	$\frac{1}{7} + \frac{1}{3} = \frac{10}{21}$	$\frac{1}{7} + \frac{1}{4} = \frac{11}{28}$	$\frac{1}{7} + \frac{1}{5} = \frac{12}{35}$	$\frac{1}{7} + \frac{1}{6} = \frac{13}{42}$	$\frac{1}{7} + \frac{1}{7} = \frac{14}{49}$
$\frac{1}{9} + \frac{1}{2} = \frac{11}{18}$	$\frac{1}{9} + \frac{1}{3} = \frac{12}{27}$	$\frac{1}{9} + \frac{1}{4} = \frac{13}{36}$	$\frac{1}{9} + \frac{1}{5} = \frac{14}{45}$	$\frac{1}{9} + \frac{1}{6} = \frac{15}{54}$	$\frac{1}{9} + \frac{1}{7} = \frac{16}{63}$

General case:  $\frac{1}{m} + \frac{1}{n} = \frac{m+n}{mn}$

## Check your progress

1  $\frac{67}{12}$  or  $5\frac{7}{12}$

2 a 10.096      b 2.638

c  $\frac{13}{24}$

3  $\frac{13}{30}$

4

9	•	2	9	1
-	5	•	6	7 9
<hr/>				
3	•	6	1	2

## Think like a mathematician

25 and 26

### Exercise 10.2

1 No. The estimate of  $564 \div 14$  is not 30 because  $600 \div 15 = 40$  (or  $600 \div 10 = 60$ )

2 a  $109 \text{ r}2$  or  $109\frac{2}{7}$   
b 27  
c 28

3 Both girls are correct because a remainder of 3 in this case is equivalent to  $\frac{3}{7}$

4 8 ( $588 \div 14 = 42$  and  $374 \div 11 = 34$ )

5 a 77  
b 64  
c 49

6 57 boxes

7 Mandy is wrong. She should find factors of 15 not decompose it.  
She should divide by 5 and 3.

$$825 \div 5 \div 3 = 165 \div 3 = 55$$

8  $576 \div 72 = 8$        $306 \div 34 = 9$

9 a 2 and 1 ( $246 \div 4 = 61 \text{ r}2$ )  
b  $61\frac{2}{4} = 61\frac{1}{2}$

10 \$27

11 a 3      b 4

## Unit 10 Multiplication and division (1)

### Getting started

1 a 4224      b 918      c 67

2  $180 \times 8 = 1440$  metres

3 2

4 40

5  $12 \times 30$  or  $30 \times 12$

### Exercise 10.1

1 No, there are too many zeros. A good estimate would be  $1500 \times 60 = 90000$

2 a 29 568      b 37 044      c 29 984

3 8638

4 Pierre thinks that 0 hundreds multiplied by  $7 = 7$  hundreds. The correct answer is 42 168.

5  $400 \times 60 = 8000 \times 3 = 20 \times 1200$

6  $79 \times 60 \times 24 = 113 760$  beats

7 a 164 670      b 163 950      c 533 470

8 a 25 764      b 67 553      c 434 625

9  $7 \times 18 \times 25 = 3150$

10 6, 7 and 4 ( $3627 \times 42$ )

## Think like a mathematician

Answers will depend on the numbers chosen by learners, but the largest answer is always found by dividing the largest dividend by the smallest divisor and the smallest answer is always found by dividing the smallest dividend by the largest divisor.

### Exercise 10.3

1 43 719 because the sum of the digits is divisible by 3 ( $4 + 3 + 7 + 1 + 9 = 24$ )

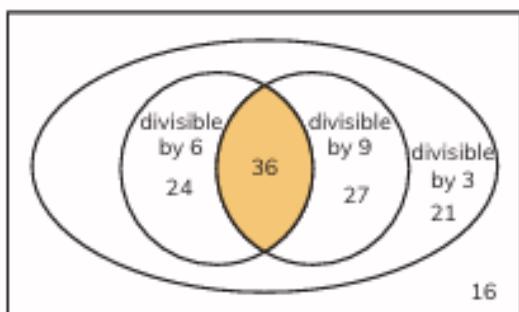
2 a  $19 \times 3 = 57$       b  $17 \times 3 = 51$   
c  $14 \times 3 = 42$  or  $15 \times 3 = 45$  or  $16 \times 3 = 48$

3 84

4 99, 108, 117, 126, 135

5 96

6



They are multiples of 3, 6 and 9.

7

	Divisible by 3	Divisible by 6	Divisible by 9
987	✓		
495	✓		✓
3594	✓	✓	

8 210

9 a 231 or 234 or 237

b 315 or 345 or 375

c 83 049 or 83 349 or 83 649 or 83 949

### Think like a mathematician

2334, 1335, 2337, 1338

2367, 1368

2634, 1635, 2637, 1638

2667, 1668

2934, 1935, 2937, 1938

2967, 1968

### Check your progress

1 a 27 672      b 235 380      c 256 428

d 77      e 54      f 19

2 Always true because the number is a multiple of 2 and a multiple of 3

3 a  $92 \div 4 = 23$  so the calculation is correct

b  $14 \times 9 = 126$  so the calculation is incorrect

4 Kofi is correct.

Vijay has forgotten to add in the 1 hundred that has been carried.

5 80

# Unit 14 Multiplication and division (2)

## Getting started

1 a  $\frac{1}{3}$  of 21 = 7      b  $\frac{1}{4}$  of 24 = 6

c  $\frac{1}{5}$  of 40 = 8

2 a 3      b 4      c 6

3 36 536

4 \$35

## Exercise 14.1

1  $\frac{4}{6} + \frac{4}{6} + \frac{4}{6} = \frac{12}{6} = 2$

$3 \times \frac{4}{6} = \frac{12}{6} = 2$  or  $\frac{4}{6} \times 3 = \frac{12}{6} = 2$

2  $5 \times \frac{2}{8} = \frac{10}{8} = 1\frac{2}{8} = 1\frac{1}{4}$  or  $\frac{2}{8} \times 5 = \frac{10}{8} = 1\frac{2}{8} = 1\frac{1}{4}$

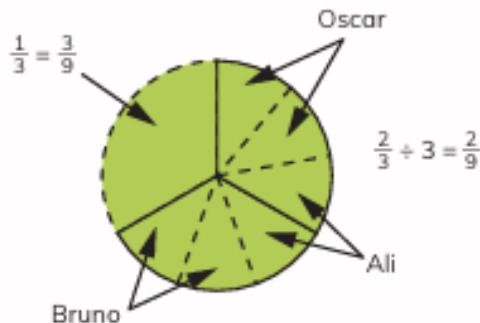
3 a  $\frac{6}{5} = 1\frac{1}{5}$       b  $\frac{35}{8} = 4\frac{3}{8}$

c  $\frac{20}{6} = 3\frac{2}{6} = 3\frac{1}{3}$

4	Answer = 1	Answer = 2	Answer = 3
	A, D, F	B, E, H	C, G

5 C

6 Diagram showing the correct fractions of the pie, for example:



7 a  $\frac{5}{16}$  b  $\frac{2}{15}$   
 8 a  $\frac{2}{5}$  b  $\frac{5}{16}$   
 c  $\frac{3}{25}$   
 9 a 6 b 9

### Think like a mathematician

$$\begin{array}{ccccc} \frac{5}{12} \div 2 & \frac{5}{8} \div 3 & \frac{5}{6} \div 4 & \frac{5}{4} \div 6 & \frac{5}{3} \div 8 \\ \frac{5}{24} & \frac{5}{24} & \frac{5}{24} & \frac{5}{24} & \frac{5}{24} \\ \frac{5}{2} \div 12 & \frac{5}{1} \div 24 & & & \end{array}$$

### Exercise 14.2

1 a 225.5 b 266.84 c 360.81  
 2 207.36  
 3 105.24  
 4 a 1115.4 b 4481.92 c 1915.64  
 5 Not correct. The answer should be:

	1	7	0	5
x	1	5		
	8	5	2	5
1	7	0	5	0
2	5	5	7	5

1

$17.05 \times 5$  should be 85.25 and not 85.75 because  $5 \times 0 = 0$ , not 5

To avoid similar errors, Parveen should remember that if any number is multiplied by zero, the answer is zero.

6  $6.47 \times 5$

7 \$183

8 \$0.78 or 78 cents ( $35.28 - 34.50 = 0.78$ )

### Think like a mathematician

$3.25 \times 64 = 208$

### Exercise 14.3

1 a 9.3 b 0.4  
 c 0.09 d 28.01  
 2 a 3.07 b 5.05  
 3 8  
 4 6.2  
 5  $12.32 \div 8 = 1.54$ , all the other answers are 1.55  
 6 \$9.84

7 Shop A, as shop A charges \$1.72 for a pot and shop B charges \$1.74 for a pot. Learners will need to think about how many pots of paint they need. The cost of 1 pot in shop A is cheaper, but they must buy 4 pots at a time. If you only needed 3 pots, you would go to shop B.

8 5.25m

### Think like a mathematician

$329.68 \div 52 = 6.34$

### Check your progress

1 a  $\frac{12}{5} = 2\frac{2}{5}$  b  $\frac{35}{6} = 5\frac{5}{6}$  c  $\frac{18}{3} = 6$

2 Both equal to  $\frac{2}{15}$

3 \$5.25

4  $8.6 \div 5 = 1.72$  is the odd one out. All the other answers are 1.75.

5  $6 \times \frac{7}{8} = 5\frac{1}{4}$        $6 \times \frac{3}{4} = 4\frac{1}{2}$        $6 \times \frac{5}{8} = 3\frac{3}{4}$

$8 \times \frac{7}{8} = 7$        $8 \times \frac{3}{4} = 6$        $8 \times \frac{5}{8} = 5$

$10 \times \frac{7}{8} = 8\frac{3}{4}$        $10 \times \frac{3}{4} = 7\frac{1}{2}$        $10 \times \frac{5}{8} = 6\frac{1}{4}$

a Smallest answer is  $6 \times \frac{5}{8} = 3\frac{3}{4}$

b Largest answer is  $10 \times \frac{7}{8} = 8\frac{3}{4}$

# Unit 16 The laws of arithmetic

## Getting started

1 Learners' own answers, showing that the order of multiplication can be changed to give the products of  $7 \times 8$  and  $5 \times 2$ , for example:  $7 \times 8 = 56$  and the other numbers are  $5 \times 2$  which is 10.

2

$$\begin{array}{c} 7 \times 24 \\ \diagup \quad \diagdown \\ 7 \times \boxed{20} = 140 \quad + \quad 7 \times \boxed{4} = \boxed{28} \\ \diagdown \quad \diagup \\ = \boxed{168} \end{array}$$

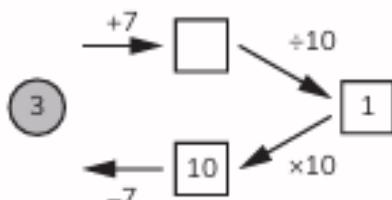
3 a 17      b 5      c 50

4 No. She is incorrect as the multiplication should be done first. The answer should be 51.

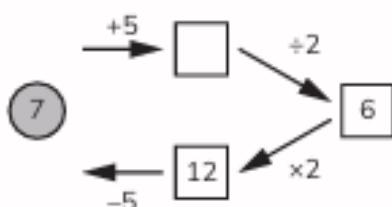
5 a  $3 \times \boxed{7} + 9 = 30$   
b  $6 \times 8 - \boxed{18} = 30$

## Exercise 16.1

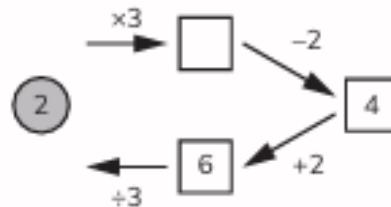
1 a  $1 \times 10 - 7 = 3$ . Tariq is thinking of the number 3.



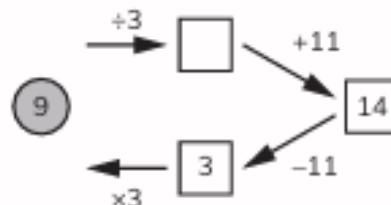
b  $6 \times 2 - 5 = 7$ . Sonja is thinking of the number 7.



c  $(4+2) \div 3 = 2$ . Pierre is thinking of the number 2.



d  $(14-11) \times 3 = 9$ . Lan is thinking of the number 9.



2 a 21      b 22      c 9  
d 8      e 1      f 6

Calculation b is the same with the brackets removed.

3 a true  
b true  
c false  $(6+3) \times 4 = 36$  or  $6+3 \times 4 = 36$   
4 a  $(6+2) \times 5 = 40$   
b  $(3+4) \times (2+4) = 42$   
c  $3 \times (4+2) = 18$   
d  $(4+3+2) \times 2 = 18$

5 Example answers:

a  $(2+5) \times 5 = 35$   
b  $(7-5) \times 10 = 20$   
c  $2 \times (14-5) = 18$

6 Learners' own answers. Any correct way to calculate  $42 \times 24$  using two factors of 24.

7 a  $(5 \times 70) + (5 \times 1) = 350 + 5 = 355$   
b  $(6 \times 60) - (6 \times 3) = 360 - 18 = 342$   
c  $(7 \times 90) + (7 \times 2) = 630 + 14 = 644$   
d  $(8 \times 40) - (8 \times 3) = 320 - 24 = 296$

8 Working should be shown for all parts (see example in part a).

$$\begin{aligned}
 \mathbf{a} \quad & 3 \times (60 + 7) \\
 &= (3 \times 60) + (3 \times 7) \\
 &= 180 + 21 \\
 &= 201 \\
 &\text{or} \\
 &3 \times (70 - 3) \\
 &= (3 \times 70) - (3 \times 3) \\
 &= 210 - 9 \\
 &= 201
 \end{aligned}$$

**b** 744      **c** 336      **d** 711

**9** **a** False, the = sign should be < because  $8 + 5 - 7 = 6$  and  $8 + 7 - 5 = 10$

**b** False, the = sign should be > because  $2 \times (3 + 4) = 14$  and  $2 \times 3 + 4 = 10$

**c** True,  $(10 \times 5) \div 2 = 25$  and  $10 \times (5 \div 2) = 25$

## Think like a mathematician

Learners' own answers. There are several possible answers including:

$$11 = (3 \times 4) - 1$$

$$12 = 3 \times 4$$

$$13 = (3 \times 4) + 1$$

$$14 = (3 \times 4) + 2$$

$$15 = (4 + 1) \times 3$$

$$16 = (3 + 1) \times 4$$

$$17 = 3 \times (4 + 1) + 2$$

$$18 = (4 + 2) \times 3$$

$$19 = 4 \times (3 + 2) - 1$$

$$20 = (3 + 2) \times 4$$

## Check your progress

**1** 2000

**2** **a** 18      **b** 12      **c** 15  
**d** 2      **e** 32      **f** 12

**3** **a** >      **b** <

**4** Example answers:

$$\begin{aligned}
 \mathbf{a} \quad & 3 \times (4 - 2) = 6 & \mathbf{b} \quad & 4 \times (3 + 7) = 40 \\
 \mathbf{c} \quad & 4 \times (15 - 12) = 12 & \mathbf{d} \quad & (18 - 3) \div 5 = 3
 \end{aligned}$$

**5**  $(4 + 5 + 1) \times 5 = 50$

# › Workbook answers

## Unit 1 The number system

### Exercise 1.1

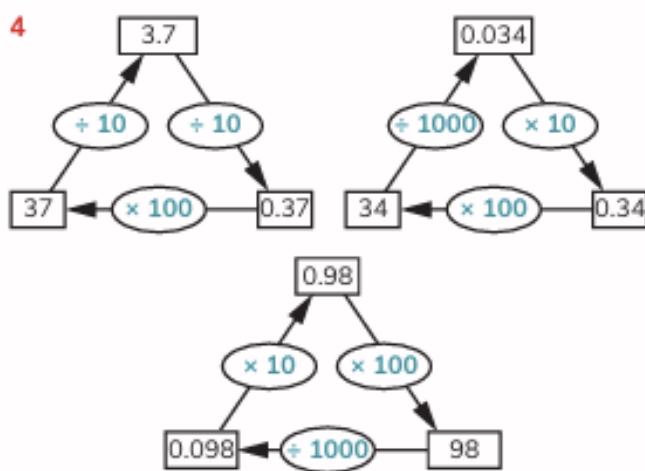
#### Focus

1  $\frac{6}{10} + \frac{7}{100}$

2 5 thousandths

3 A: 5607 tenths + 9 thousandths, C:  $56 + 0.79$

4



5  $91.969 = 90 + 1 + 0.9 + 0.06 + 0.009$

6 0.645

#### Practice

7 5 tenths, 6 thousandths, 7 ones

8 a 560      b 880      c 412.8  
d 0.67      e 1.91      f 0.63

9 D

in	out
1.5	1500
0.937	937
16.24	16240
0.49	490
0.07	70

11 -24.976

#### Challenge

12 To multiply by 100, you move each digit two places to the left. If you multiply a whole number by 100, this has the effect of adding two zeros but this does not work for all numbers, for example,  $1.5 \times 100$  does not equal 1.500.

13 0.007

14 Anton: 4.5, Ben: 0.045, Kasinda: 45 and Anya: 0.45

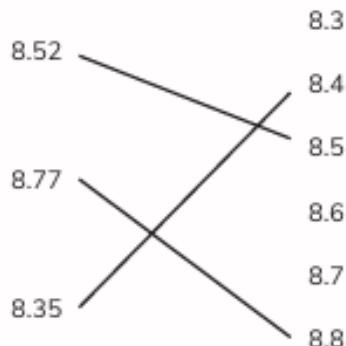
15 Leila has made the number 51.111. If she had put all her counters in the tens column, she would have made the number 90.

$$90 > 51.111$$

### Exercise 1.2

#### Focus

1  $\text{_____} \rightarrow$  rounds to



2 10.35, 9.55, 10.05, 9.5

3 a 7.8      b 8

Number	Number rounded to the nearest tenth	Number rounded to the nearest whole number
3.78	3.8	4
4.45	4.5	4
3.55	3.6	4
4.04	4.0	4

## Practice

**5** 100.45

**6** 19.42

**7** 1.45 and 3.45

**8** 10.49

## Challenge

**9** 3.34

**10** JULY

**11** 16.51 rounded to the nearest whole number is 17.

17.49 rounded to the nearest whole number is 17.

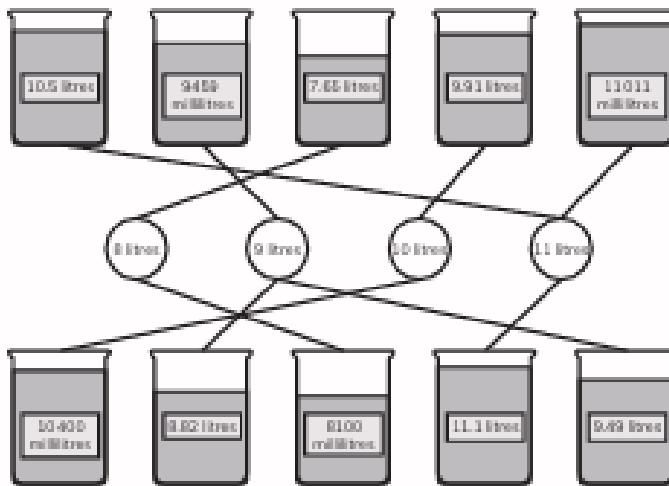
Both answers are 17.

16.51 rounded to the nearest tenth is 16.5.

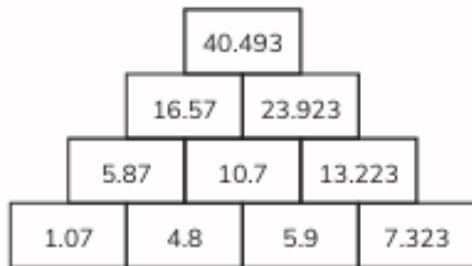
17.49 rounded to the nearest tenth is 17.5.

The difference between 17.5 and 16.5 is 1 so Stefan is correct.

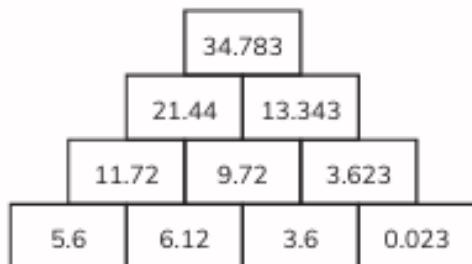
**12**



8 a



b



## Unit 8 Addition and subtraction (2)

### Exercise 8.1

#### Focus

1  $2 \rightarrow 1 + 0.9 + 0.10$   
 $1.35 \rightarrow 1 + 0.3 + 0.05$   
$$\begin{array}{r} 0 + 0.6 + 0.05 \\ \hline = \$ 0.65 \end{array}$$

2  $3.7 \text{ kg}$

3 a  $19.6$

b  $2.638$

4  $0.003 + 0.007 = 0.01$

$0.004 + 0.006 = 0.01$

#### Practice

5 a  $\$56.75$  b  $\$3.25$

6 0.26 metres

7  $349.05 + 71.6$

~~340.1 - 124.26~~  
~~234.81 + 81.4~~  
~~470.08 - 45.12~~

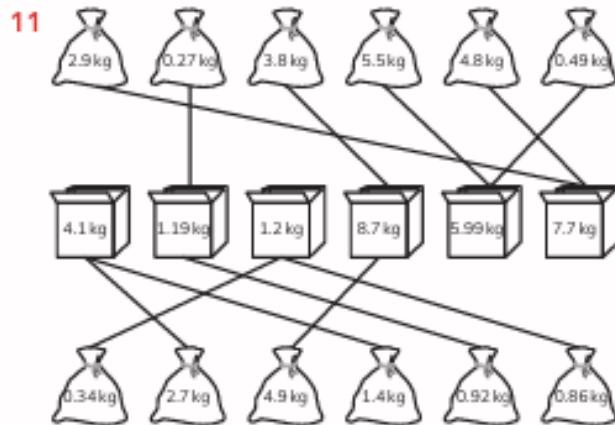
200  
300  
400

### Challenge

9 a Complete calculation is:  
 $9.37 - 5.687 = 3.683$

b Complete calculation is:  
 $3.467 + 7.89 = 11.357$

10 Learners' own answers. Any three decimals that satisfy the criteria, for example:  
 $0.14 + 0.239 + 0.621$



### Exercise 8.2

#### Focus

1  $\frac{1}{12}$

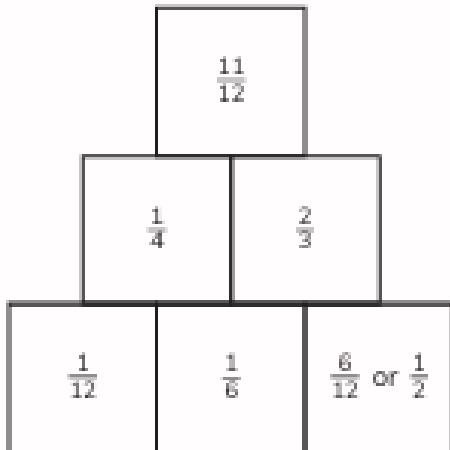
2 a  $\frac{21}{20} = 1\frac{1}{20}$  b  $\frac{11}{12}$  c  $\frac{31}{24} = 1\frac{7}{24}$

3 a  $\frac{1}{10}$  b  $\frac{1}{12}$  c  $\frac{2}{15}$

**4**

Answer less than 1	Answer equal to 1	Answer more than 1
B	C	A D

### Practice

**5**

**6** Chata has added the numerators together and added the denominators together. He should use his knowledge of equivalent fractions to find fractions with a common denominator.

Correct answer:

$$\frac{3}{5} + \frac{3}{8} = \frac{24}{40} + \frac{15}{40} = \frac{39}{40}$$

**7**  $\frac{27}{20}$  ( $1\frac{7}{20}$ ) hour (or 1 hour 21 minutes)

**8**  $\frac{4}{15}$

### Challenge

**9** 3

**10**  $\frac{9}{40}$

**11**  $\frac{41}{12} = 3\frac{5}{12}$  hours (or 3 hours 25 minutes)

**12**  $\frac{1}{5} + \frac{1}{2}$  and  $\frac{3}{5} + \frac{1}{10}$  are both possible answers

## Practice

2 Estimates may vary but it should be clear how learners have arrived at the estimate.

a Estimate:  $2000 \times 7 = 14\,000$   
Answer: 10 822

b Estimate:  $2000 \times 8 = 16\,000$   
Answer: 19 184

c Estimate:  $4000 \times 6 = 24\,000$   
Answer: 21 564

3  $172 \times 6 = 1032$

4 The estimate is a good one because  $3000 \times 70 = 210\,000$ .

5  $15 \times 90$  or  $90 \times 15$

6  $10 \times 1200$     $100 \times 120$     $20 \times 600$     $200 \times 60$   
 $30 \times 400$     $300 \times 40$

## Challenge

7 Ella is correct.  
Roz has forgotten to add in the 1 hundred that has been carried on the line 29 280.

8 243 793

9 20 676 km

10 Apollo took the most money.  
Apollo:  $2108 \times \$45 = \$94\,860$   
Lif:  $1935 \times \$39 = \$75\,465$   
Legend:  $2245 \times \$42 = \$94\,290$   
Mani:  $1649 \times \$47 = \$77\,503$

## Unit 10 Multiplication and division (1)

### Exercise 10.1

## Focus

1	1	5	3	2	9			3	7	2
4				4	4	2	2	4		
5	4	5	6	1	8			1		
4			4			7	1	2	6	8
	9	2	9	10	2	8				0
11	1	5	6	8			12	5	1	2
		6		13	6	2	8			4
14	1	5	4	8			15	5	4	

## Exercise 10.2

## Focus

**1** 93  
**2** \$38  
**3** 83 weeks  
**4** 124 t-shirts

## Practice

**5** a 3  
**6** 78  
**7** 50 people  
**8** 15 packs

### Challenge

9 Leanne is correct. Carrie has decomposed 24 instead of finding the factors of 24.

10 9 and 5 ( $942 \div 4 = 235$  r2)

11 a  $592 \div 4 = 148$       b  $389 \div 5 = 77$  r4  
c  $476 \div 3 = 158$  r2

### Exercise 10.3

#### Focus

1 4563 and 234 567 because the sum of the digits is divisible by 3

2 a 7023 or 7323 or 7623 or 7923  
b 50127 or 50157 or 50187

3

	divisible by 9	not divisible by 9
even	2322 321 426	2348 723 142
not even	770 679 2331	4867 126 147

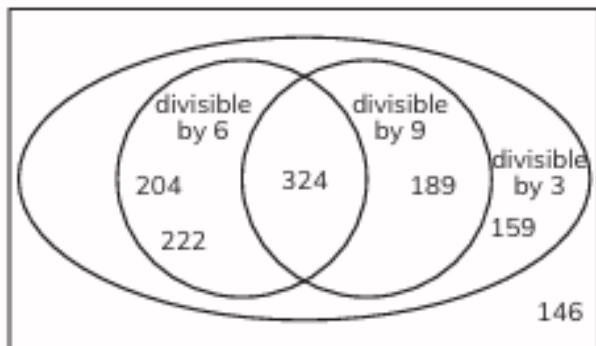
#### Practice

4 C

5

	3	6	9
21 471	✓		
482 211	✓		✓
152 214	✓	✓	

6



### Challenge

7 Yes. Multiples of 6 must be even and a number ending in 3 is odd.

8 Many possible answers including 171 (divisible by 3), 522 (divisible by 6) and 117 (divisible by 9).

9 a Any 5-digit numbers that satisfy the criteria.  
b All numbers that are divisible by 9 are also divisible by 3.

# Unit 14 Multiplication and division (2)

## Exercise 14.1

### Focus

1 Addition:  $\frac{3}{8} + \frac{3}{8} + \frac{3}{8} + \frac{3}{8} = \frac{12}{8}$  (or  $1\frac{4}{8}$  or  $1\frac{1}{2}$ )

Multiplication:  $\frac{3}{8} \times 4 = \frac{12}{8}$  (or  $1\frac{4}{8}$  or  $1\frac{1}{2}$ ) or

$4 \times \frac{3}{8} = \frac{12}{8}$  (or  $1\frac{4}{8}$  or  $1\frac{1}{2}$ )

2 a  $\frac{2}{9}$  b  $\frac{3}{20}$

3 a 4 b 15

4  $\frac{4}{5} \div 3 = \frac{4}{15}$

### Practice

5 a  $\frac{7}{27}$  b  $\frac{3}{28}$

6 3 boxes

7 a

x	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{5}{8}$	$\frac{7}{8}$
3	$\frac{3}{8}$	$\frac{9}{8} = 1\frac{1}{8}$	$\frac{15}{8} = 1\frac{7}{8}$	$\frac{21}{8} = 2\frac{5}{8}$
4	$\frac{4}{8} = \frac{1}{2}$	$\frac{12}{8} = 1\frac{1}{2}$	$\frac{20}{8} = 2\frac{1}{2}$	$\frac{28}{8} = 3\frac{1}{2}$
5	$\frac{5}{8}$	$\frac{15}{8} = 1\frac{7}{8}$	$\frac{25}{8} = 3\frac{1}{8}$	$\frac{35}{8} = 4\frac{3}{8}$

b Because  $5 \times 3$  (eighths) =  $3 \times 5$  (eighths)

$$\frac{3}{8} \times 5 \text{ and } \frac{5}{8} \times 3 = \frac{15}{8}$$



$$3 \times \frac{5}{8} = \frac{15}{8}$$



$$5 \times \frac{3}{8} = \frac{15}{8}$$

8  $\frac{3}{20}$  metre

## Challenge

9 No.

4 lots of  $\frac{3}{8} = \frac{12}{8}$  which is  $1\frac{1}{2}$



10

Answer $\frac{1}{6}$	Answer $\frac{1}{3}$	Answer $\frac{1}{12}$
B F	E	A C D

11 a  $\frac{2}{3}$  of 21 = 14

b  $\frac{3}{4}$  of 24 = 18

c  $\frac{2}{5}$  of 40 = 16

12  $\frac{2}{3} \div 4 = \frac{1}{6}$

## Exercise 14.2

### Focus

1 a 144.6      b 72.8      c 204.5

2 \$23.25

3 \$60.40

4  $12.45 \times 9$  — answer more than 100

$15.4 \times 6$  — answer less than 100

$13.84 \times 7$  — answer less than 100

$12.5 \times 8$  — answer equal to 100

### Practice

5

x	6	4	7
0.56	3.36	<b>2.24</b>	3.92
0.27	<b>1.62</b>	1.08	1.89
0.69	4.14	2.76	<b>4.83</b>

6 Learners' own answers. For example:  $16.25 \times 8 = 130$  is the only one with a whole number answer. All other answers have 1 decimal place.

7 a 509.3      b 903.9      c 833

8 \$55.25

## Challenge

9 \$643.50

10 248.64

11 No.  $18 \times 0.3 = 5.4$  which is bigger than 5 (5 tonnes is the maximum load).

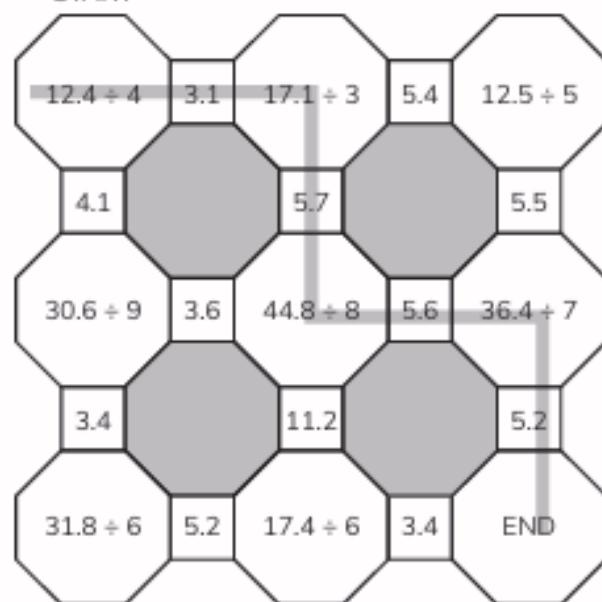
12 Yes.  $5.35 \times 13 = 69.55$  which is less than 75 (she would need 69.55 kg and she has 75 kg).

## Exercise 14.3

### Focus

1 a 4.8      b 3.2      c 4.3

2 START



3 \$1.62

4 4.99 metres

### Practice

5

Answer less than 10	Answer between 10 and 20	Answer more than 20
$76.32 \div 8 = 9.54$	$56.2 \div 5 = 11.24$	$61.2 \div 3 = 20.4$
$24.15 \div 7 = 3.45$		

**6** 16.4

**7**  $16.8 \div 7 = 2.4$  is the odd one out. All the others have an answer of 2.6.

**8** **a**  $91.05 \div 15 = 6.07$

**b**  $73.44 \div 12 = 6.12$

**c**  $87.22 \div 14 = 6.23$

**d**  $78.52 \div 13 = 6.04$

**e**  $111.24 \div 18 = 6.18$

**f**  $98.72 \div 16 = 6.17$

6.18 (part e) is not on the grid. 6.15 is not needed.

## Challenge

**9** Deal B because the cost for each bag is less.

Deal A: bags cost  $\$5.08 \div 4 = \$1.27$  each

Deal B: bags cost  $\$6.25 \div 5 = \$1.25$  each

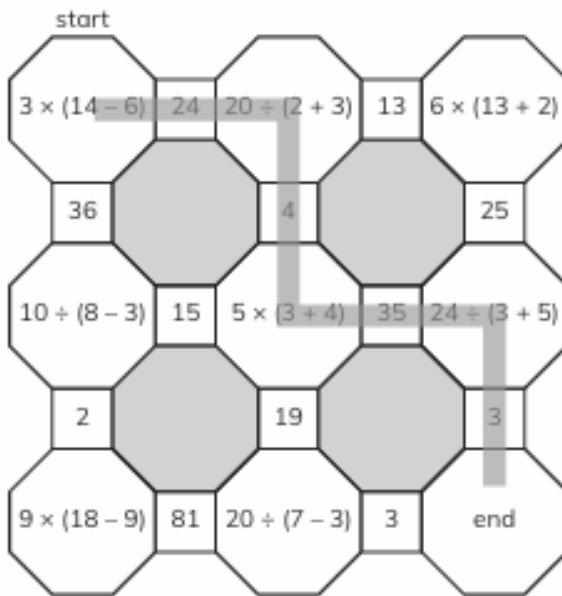
**10** 5

**11**  $939.7 \div 9 = 93.3$

Estimate  $900 \div 9 = 100$  so the answer to  $939.7 \div 9$  must be greater than 100.

**12** 37 ( $562.5 \div 15 = 37.5$ )

3



4 C is wrong as the answer should be 36.

### Practice

$$\begin{aligned}
 5 \quad 36 \times 97 &= 36 \times (100 - 3) \\
 &= (36 \times 100) - (36 \times 3) \\
 &= 3600 - 108 \\
 &= 3492
 \end{aligned}$$

6 No. Mandy should do multiplication before addition. The answer to the calculation is 94.

Mandy could get the answer 130 by adding brackets.

$$(4 + 9) \times 5 \times 2 = 130$$

7 9

8 A is equivalent to  $8 \times 12$ 

B: 12 is wrongly decomposed as  $(1 + 2)$  instead of  $(10 + 2)$

C: Correctly writes 12 as  $10 + 2$  but only applies the multiplication by 8 to 10

D: Incorrectly writes 12 as the product of 10 and 2

It would also be acceptable if the learners just demonstrated that the calculations do not equal 96.

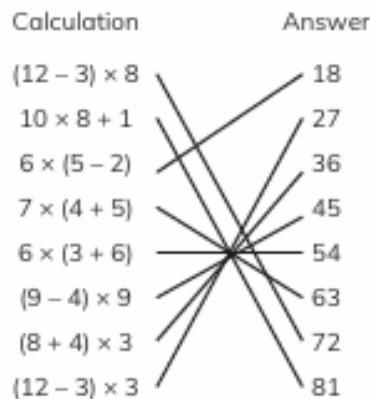
9 a &gt; b = c &lt;

## Unit 16 The laws of arithmetic

### Exercise 16.1

#### Focus

1 Calculation

2  $9 \times 5$ 

#### Challenge

$$\begin{array}{ll}
 10 \quad a & 4 \qquad \qquad \qquad b & 2 \\
 & c & 5 \qquad \qquad \qquad d & 3
 \end{array}$$

**11** **a**  $(14 - 12) \times 5 = 10$       **b**  $11 - (6 - 5) = 10$

**c**  $20 - (15 - 5) = 10$       **d**  $20 \div (4 - 2) = 10$

**12** **a** 5      **b** 3      **c** 3

**d** 4      **e** 8      **f** 3

**13**  $25 - (7 + 8) = 10$  or  $25 - (8 + 7) = 10$

**14** **a**  $5 \times (2 + 6)$ . You could have a slightly different order, for example,  $(2 + 6) \times 5$ .

**b**  $(5 + 3) \div 2$  or  $5 - (3 - 2)$  or  $2 \times (5 - 3)$

**c**  $4 \times (6 - 3)$ . You could have a slightly different order, for example,  $(6 - 3) \times 4$ .

**15**  $25 \times 4 \times 3 + 7$

$= 100 \times 3 + 7$

$= 307$

or

$(25 \times 10) + (25 \times 2) + 7$

$= 250 + 50 + 7$

$= 307$