



Primary  
Practice

mass

prism

$12\text{cm}^2$

# Maths



# Practice

$(4, 7)$

length

# Year 4

acute

$-10$

Answers

isosceles

numerator



XVIII

Includes explanations

Schofield & Sims

# Notes for parents and carers

These answers are provided to accompany the **Maths Practice Year 4 Question Book**, which is part of the **Schofield & Sims Primary Practice Maths** series. Answers for all books in the series can be downloaded from the **Schofield & Sims** website.

## The structure

This PDF contains answers for every question in the book. Navigate the PDF document by clicking on the hyperlink for the desired topic in the Contents page. Questions are presented in the order they appear in the book.

In most units, explanations are included for each set of questions to support understanding of the objective being covered. These explanations may suggest methods for working through each question. Explanations are also supplied for questions that children may find particularly challenging. Question number references have been added to answers when explanations from earlier questions may aid understanding.

In the 'Final practice' section, explanations have been provided for every question. Marking guidance is provided alongside the explanation to demonstrate how to allocate partial and full credit for work as applicable.

## Using the answers

Encourage children to work through each question carefully. They should begin by reading the question thoroughly and identifying key terminology before forming their answer.

Although units have been included with these answers to aid understanding, note that children do not need to write the units in their answers for the answers to be marked correct unless it is specified in the question that units should be included.

Some questions in the **Maths Practice Year 4 Question Book** have multiple answers. The explanations accompanying the answers in this document indicate where this is the case. For these questions, accept any possible answers according to the limits laid out. There is no preference for any examples provided in this document over other possible answers not listed and no preference for answers listed first.

Where children have given an answer that is not correct, it may be useful to work through the question with them to correct any misunderstandings.

## Marking the 'Final practice' section

The timing for the 'Final practice' section is intended as a guide only. Some children may prefer to work through the section with a longer time limit or without a time limit.

The marking guidance for some questions indicates that children may receive one mark for a correct method that would lead to a correct answer. This is intended to recognise ability in cases where children have used the correct method but have made a calculation error that has led to the use of incorrect figures in their calculation.

After completing the 'Final practice' section, children may choose to revise topics that they have identified as challenging. If they are comfortable with the material already covered, you may wish to print out and award the editable certificate from the **Schofield & Sims** website to recognise their achievement. The child may then wish to advance to the **Maths Practice Year 5 Question Book**.

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## Counting in multiples (pages 4–5)

### Practise

- 36 42 48  
Subtract the first number from the second number to find out how the sequence works.  $12 - 6 = 6$ . The sequence is a +6 sequence.  $12 + 6 = 18$ .  $18 + 6 = 24$ .  $24 + 6 = 30$ . All the numbers are multiples of 6. Find the next three numbers in the sequence.  $30 + 6 = 36$ .  $36 + 6 = 42$ .  $42 + 6 = 48$ .
  - 42 49 56
  - 54 63 72
  - 150 175 200
- 4896  
The digit 3 in 3896 has a value of 3000. Adding 1 to the thousands digit will increase the number by 1000.
  - 8934
  - 8003
  - 13824
  - 5922  
The digit 6 in 6922 has a value of 6000. Subtracting 1 from this digit will decrease the number by 1000.
  - 7334    g. 7825    h. 11824
- 42  
The multiples of 6 are: 6, 12, 18, 24, 30, 36, 42 and 48. The multiples of 7 are: 7, 14, 21, 28, 35, 42 and 49. The lowest common multiple of both 6 and 7 is 42.
  - 18    c. 24

### Extend

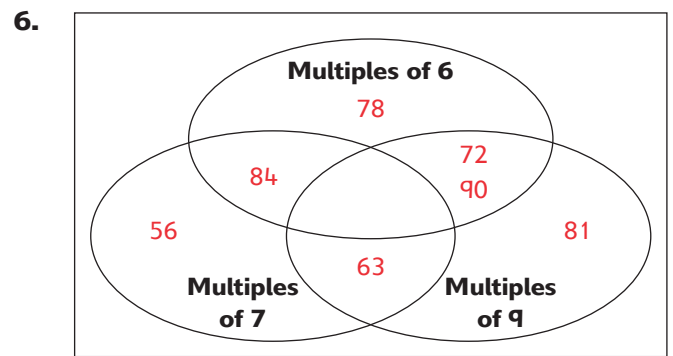
- 63 81  
Use the method used in **Question 1**.
  - 70 84

5.

	Subtract 1000 →				
Add 1000 ↓	9739	8739	7739	6739	5739
	10739	9739	8739	7739	6739
	11739	10739	9739	8739	7739

Add or subtract 1000 by adding 1 to or subtracting 1 from the digit in the thousands column.

## Apply



Use a Venn diagram to place numbers into sets. Each set is shown by an oval. If a number belongs in more than one set, it is placed in the overlapping section. For example: 63 is a multiple of both 7 and 9, so it is placed where these two sets overlap.

- £2843  
Read the word problem carefully and identify the numbers and operations needed. The calculation is  $£1843 + £1000$ , so the thousands digit is increased by 1.
  - £4075

## Place value (pages 6–7)

### Practise

- 700 or seven hundred(s)  
When working out number and place value, it can be helpful to put numbers into a place value chart. For example:
 

Th	H	T	O
5	7	0	2

 In the four-digit number 5702, there are 5 thousands, 7 hundreds, 0 tens and 2 ones. The digit 7 appears in the hundreds column, so it is worth 700 or seven hundred(s). Make sure the 0 in 5702 is put in the tens column.
  - 7 or seven (ones)
  - 7000 or seven thousand(s)
- 4 or four (ones)
  - 400 or four hundred(s)
  - 40 or four tens or forty
- 2000 or two thousand(s)
  - 20 or two tens or twenty
  - 200 or two hundred(s)

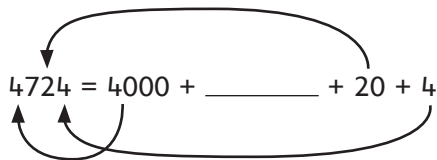
4. a. **6592** **2591**  
Identify any number with the digit 5 in the hundreds column. It may help to use a place value chart for each number.

- b. **5782** **3087**  
c. **3910** **3814** **3007**

5. a. **2828, 3614, 5890, 6827, 7825**  
Use a place value chart to compare the numbers. Work from the left-hand column to the right. The four-digit numbers with the least value use the lowest value digits. 2828 has the least value because it only has two thousands.  
b. **4310, 4800, 5711, 6087, 6925**

### Extend

6. a. **700**  
Check the place value of the digits in 4724 and compare with the partitioned numbers.



700 is not given in the partitioned numbers, so it is the missing number. As a check, add the partitioned numbers and compare with 4724.  $4000 + 20 + 4 = 4024$ .  $4724 - 4024 = 700$ .

- b. **20**  
c. **2378**  
Use the place value of the numbers to add the partitions.  
d. **7463** e. **6000** **20** f. **6**

7. a. **4820**  
Use a place value chart to compare the numbers. Work from the left-hand column to the right.

Th	H	T	O
4	8	2	0
4	0	0	2
4	7	2	3
4	8	0	9

All the numbers have 4 thousands. The numbers with 8 hundreds are the larger, but 4820 has 2 tens, whereas 4809 has none.

- b. **7909** c. **8092** d. **3302**

8. a. **5688**  
Compare the numbers with the number immediately to the left and right. The missing number must be greater than 5655 and less than 5690. The answer must be 5688.  
b. **5698** c. **5701**

### Apply

9. a. **8653**  
Use a place value chart to arrange the numbers. The digits with the greatest value must appear in the place value columns of the largest value.  
b. **8536**  
The lowest value even number must appear in the ones column to make the number an even number. The remaining digits with the greatest value must appear in the place value columns of the largest value.  
c. **5863**  
Write the largest number with 5 thousands and the smallest number with 6 thousands. Find the difference between 6000 and each of these numbers.  $6358 - 6000 = 358$ .  $6000 - 5863 = 137$ . The smallest difference of 137 means 5863 is closest to 6000.

10. **3619**  
Solve each clue one at a time. It may help to write each number in a place value chart.

Th	H	T	O
3	6	1	9

The hundreds digit is an even number between 4 and 8, so it must be 6. The thousands digit is half the hundreds digit, so it must be 3. The ones digit is three times the thousands digit, so it must be 9. The tens digit is 2 less than the thousands digit, so it must be 1.

### Roman numerals (pages 8–9)

#### Practise

1. a.  **$10 + 10 + 5 + 1 = 26$**   
Change each Roman numeral into a number. XXVI =  $10 + 10 + 5 + 1$ . Calculate the total.  $10 + 10 + 5 + 1 = 26$ .  
b.  **$10 + 10 + 10 + 1 = 31$**   
c.  **$50 + 5 = 55$**   
d.  **$50 + 10 + 5 + 1 = 66$**   
e.  **$50 + 10 + 10 + 1 + 1 = 72$**

2. a.  $10 + 10 - 1 = 19$

Where a Roman numeral of a lesser value is in front of another Roman numeral it means subtract. Change each Roman numeral into a number. XIX = 10 + 10 - 1. Calculate the total.  $10 + 10 - 1 = 19$ .

b.  $10 + 5 - 1 = 14$

c.  $50 - 10 = 40$

d.  $50 + 10 + 10 + 10 - 1 = 79$

e.  $100 - 10 + 5 - 1 = 94$

### Extend

3. a. 28

Change each Roman numeral into a number. XXVIII = 10 + 10 + 5 + 1 + 1 + 1. Calculate the total.  $10 + 10 + 5 + 1 + 1 + 1 = 28$ .

b. 38      c. 76      d. 87      e. 49

f. 66      g. 90      h. 99      i. 47

4.

XLIV	XLV	XLVI	XLVII	XLVIII	XLIX
LIV	LV	LVI	LVII	LVIII	LIX
LXIV	LXV	LXVI	LXVII	LXVIII	LXIX
LXXIV	LXXV	LXXVI	LXXVII	LXXVIII	LXXIX

Change the Roman numerals into numbers.

44	45	46	47		
----	----	----	----	--	--

Decide what the missing numbers are and write them as Roman numerals.

XLIV	XLV	XLVI	XLVII	48 XLVIII	49 XLIX
------	-----	------	-------	--------------	------------

Repeat this process on every row.

5. a. III

Change each number into the letters available to use and combine them to make the number. 1 = I. 3 = 1 + 1 + 1 = III.

b. XII

For numbers with two or more digits, partition the number into numbers that can be turned into Roman numerals.  $12 = 10 + 1 + 1$ .  $10 = X$ .  $1 = I$ .  $12 = XII$ .

c. XVII      d. XXII      e. XXIX      f. XXXIV

### Apply

6. a. 16 XVI

Change each Roman numeral into a number and calculate the answer.  $7 + 9 = 16$ . Change the number into Roman numerals.  $16 = XVI$ .

b. 32 XXXII      c. 8 VIII      d. 21 XXI

e. 100 C      f. 68 LXVIII

7. a. XXXIX

Use the method used in Question 6.

b. LXVII

c. -20

Change both Roman numerals into digits. XLVI = 46. XXVI = 26. Decide the missing operation and missing number.  $46 - 20 = 26$ .

d. LI

## Representing numbers (pages 10–11)

### Practise

1. a. 80

Use place value. The parts are 2000, 500 and 3. Compare the parts with the whole. 80 is missing.

b. 7278

2. a. 2736

Count the beads in each column on the abacus.

b. 3418      c. 5463

3. a. 1346

Count the blocks, flats, rods and cubes. Each block is 1000. Each flat is 100. Each rod is 10. Each cube is 1. 1 block, 3 flats, 4 rods and 6 cubes makes 1346.

b. 3244      c. 2528

### Extend

4. A = 175      B = 225      C = 350      D = 475      E = 550

The numbered divisions are marked in hundreds. There are 4 unmarked divisions. Each division must be 25 ( $100 \div 4$ ). Count forwards or backwards from the marked divisions in sets of 25 to find the numbers shown by the arrows. For example: A is pointing at the unmarked division before 200.  $200 - 25 = 175$ .

5. a. 3706

The digit with the greatest value is first, which is 3 thousands. The next digit will be 7 hundreds. The next card shows 6 ones, so there are 0 tens. The 0 is needed as a placeholder in the tens column and will be followed by 6 ones.

b. 2084      c. 9405      d. 6024

## Apply

6. a. 9500  
Add the number of beads together.  $2 + 5 + 1 + 6 = 14$ . Arrange the beads so they give the greatest value. The question asks for a four-digit number. 9 are used in the thousands column, the rest in the hundreds column.
- b. 9 beads  
Add the beads.  $2 + 5 + 1 + 6 = 14$ . Decide how many beads are needed to show 3875.  $3 + 8 + 7 + 5 = 23$ . Find the difference.  $23 - 14 = 9$ .
- c. 1 bead
7. a. 5312  
List the letters and the values in full.  $a = 0$ ,  $b = 1$ ,  $c = 2$ ,  $d = 3$ ,  $e = 4$ ,  $f = 5$ ,  $g = 6$ ,  $h = 7$ ,  $i = 8$ ,  $j = 9$ . Match the letters in the numbers to their values.
- b. 7904    c. 2647

## Rounding numbers (pages 12–13)

### Practise

1. a. 340  
Use the number line in the question. Determine whether the arrow is nearer to 340 or 350.
- b. 340    c. 350    d. 350
2. a. 7300    b. 7300  
c. 7400  
The number indicated is 7350, which is the same distance from 7300 and 7400. Always round up if the number is exactly half-way between two numbers.
- d. 7400
3. a. 6400  
The nearest multiples of 100 to 6449 are 6400 and 6500. 6449 is nearer to 6400, as it is less than half-way between 6400 and 6500. It may be helpful to use a number line. A quick method to work out which multiple a number is closest to is to look at the digit to the right of the digit being rounded to. In this case, look at the tens digit. If the tens digit is 0, 1, 2, 3 or 4, round down. If the tens digit is 5, 6, 7, 8 or 9, round up.
- b. 2900  
c. 7200

- d. 6000  
The nearest multiples of 1000 to 5756 are 5000 and 6000. Look at the digit to the right of the thousands digit (the hundreds digit). It is 7, so round up to 6000.
- e. 7000    f. 9000

### Extend

4. a. 600  
Use the method used in **Question 3**.
- b. 3100    c. 6700
5. a. 4000    b. 6000    c. 9000
6. a. 5600    2960    3420    6990    8280    2680  
Use the method used in **Question 3**.
- b. 5600    3000    3400    7000    8300    2700
- c. 6000    3000    3000    7000    8000    3000  
9 rounds up to 10. Keep the 0 in the column being rounded. Add one to the next place value column to the left.

### Apply

7. a. 2756    2845  
Round each number to the nearest 100 to see which ones round to 2800.
- b. 3690    4099    3911    4444
8. a. Accept any three numbers  $\geq 3995$  and  $< 4005$ .
- b. Accept any three numbers  $\geq 3950$  and  $< 4050$ .
- c. Accept any three numbers  $\geq 3500$  and  $< 4500$ .

## Negative numbers (pages 14–15)

### Practise

1. a. -1  
Use the number line in the **Remember** box to continue the sequences.
- b. -3  
c. -4    -5    -6    -7
2. a. -2    -5    -8  
b. 3    1    0    -2    -3  
c. -3    -4    -6    -7    -8    -9
3. a. -2    b. -2    c. -5  
d. -6    e. 6

### Extend

4. a. -4    b. -4    c. -11    d. 1

5. a.  $-40 \quad -35 \quad -30 \quad -20 \quad -15$   
Identify the sequence. It is a +5 sequence. Calculate the missing numbers.  $-45 + 5 = -40$ . This is counting forwards 5 on a number line. Keep adding 5 to find all the missing numbers.

- b.  $-70 \quad -60 \quad -50 \quad -20 \quad -10 \quad 0$   
This is a +10 sequence.

6. a.  $0, -3, -7, -10$   
Use a number line to position the numbers in order.

- b.  $10, 5, -5, -10$

### Apply

7. a.  $-2^{\circ}\text{C}$   
Use the thermometer as a number line.  $6^{\circ}\text{C} - 8^{\circ}\text{C} = -2^{\circ}\text{C}$ .

- b.  $-4^{\circ}\text{C}$

- c.  $0^{\circ}\text{C}$

8. a.  $2^{\circ}\text{C}$     b.  $7^{\circ}\text{C}$     c.  $-2^{\circ}\text{C}$

9. a.  $-4$   
Use the method used in **Question 5**. This is a  $-2$  sequence.

- b.  $-2$     c.  $-3$     d.  $-4$

## Addition and subtraction (pages 16–17)

### Practise

1. a. **1000**  
Set the numbers out as a column addition. Remember to exchange numbers where necessary.

$$\begin{array}{r} 4 \quad 2 \quad 6 \\ + 5 \quad 7 \quad 4 \\ \hline 1 \quad 0 \quad 0 \quad 0 \\ \hline 1 \quad 1 \end{array}$$

- b. **196**  
Set the numbers out as a column subtraction. Remember to exchange numbers where necessary.

$$\begin{array}{r} \overset{5}{\cancel{8}} \overset{1}{4} \quad 8 \\ - 4 \quad 5 \quad 2 \\ \hline 1 \quad 9 \quad 6 \end{array}$$

- c. **333**    d. **9013**    e. **2851**    f. **9720**

2. a. **800 794**  
Estimate by rounding to the nearest 100. 476 rounded to the nearest 100 is 500. 318 rounded to the nearest 100 is 300. Add the two rounded numbers to get the estimated answer.  $500 + 300 = 800$ . Find the actual answer by adding  $476 + 318$ . Use the method used in **Question 1**.  $476 + 318 = 794$ .

- b. **600 582**

- c. **1600 1598**

- d. **1000 1345**

3. a.  **$7806 - 2282 = 5524$  7905**  
Use the methods used in **Question 1**. The inverse calculation starts with the answer and works in reverse.  $7806 - 2282 = 5524$ . This shows the answer of 7806 is not correct. Calculate the actual answer.  $5623 + 2282 = 7905$ .

- b.  **$3112 + 3095 = 6207$  3092**

- c.  **$3638 + 4372 = 8010$  3528**

### Extend

4. a. **15263**  
Use the methods used in **Question 1**.

- b. **1945**    c. **4378**    d. **14270**

- e. **5899**    f. **13923**

5. a. **14000**  
Use the method used in **Question 2**. 7245 rounded to the nearest 1000 is 7000. 6922 rounded to the nearest 1000 is 7000. Make sure each number is rounded before completing the calculation.  $7000 + 7000 = 14000$ .

- b. **10000**    c. **3000**    d. **8000**

6. a. **4746**  
A bar model shows the calculation.

10833	
6087	4746

Subtract 6087 from 10833.  $10833 - 6087 = 4746$ . Use the method used in **Question 1**.

- b. **2363**  
A bar model shows the calculation.

5098	
2363	2735

Subtract 2735 from 5098.  $5098 - 2735 = 2363$ . Use the method used in **Question 1**.



- c. 1154  
d. 3190  
e. 9068

A bar model shows the calculation.

9068	
4909	4159

Add 4159 to 4909.  $4909 + 4159 = 9068$ .  
Use the method used in **Question 1**.

- f. 2467

## Apply

7. a. 6190

To find Arthur's number, work in reverse from the answer. The inverse of addition is subtraction. The inverse of subtraction is addition.  $1\text{st number} + 628 - 4724 = 2094$ . Work in reverse one step at a time.  $2094 + 4724 = 6818$ .  $6818 - 628 = 6190$ .

- b. 8880  
c. 9089

8. a. 3395 1263

When looking for a missing number, always begin where there is only one missing number. Begin with the vertical column. Add the numbers in the column and subtract the total from 7750.  $2380 + 1975 = 4355$ .  $7750 - 4355 = 3395$ . Repeat the same process using the two numbers now in the horizontal row to find the remaining missing number.  $3395 + 3092 = 6487$ .  $7750 - 6487 = 1263$ .

- b. 2370 1580 3800

## Addition and subtraction word problems (pages 18–19)

### Practise

1. a. 637 bottles

Read word problems carefully and identify the numbers and operations needed. This word problem uses one step. When subtracting larger numbers, set the calculation out as a column subtraction.

$$\begin{array}{r}
 \begin{array}{cccc}
 & 4 & & 7 \\
 8 & 1 & 4 & 8 & 1 & 2 \\
 - & 4 & 8 & 4 & 5 \\
 \hline
 & 6 & 3 & 7 & & 
 \end{array}
 \end{array}$$

- b. 602 spectators

- c. 52 years old  
d. 7540 runners  
e. 5323 people

This word problem uses one step. When adding larger numbers, set the calculation out as a column addition.

$$\begin{array}{r}
 \begin{array}{cccc}
 3 & 4 & 7 & 8 \\
 + & 1 & 8 & 4 & 5 \\
 \hline
 5 & 3 & 2 & 3 \\
 \hline
 1 & 1 & 1 & & 
 \end{array}
 \end{array}$$

- f. 4672m      g. 2234 pencils

## Extend

2. a. 23064 people

Use the methods used in **Question 1**.

- b. 1772 tins  
c. 1349 tickets  
d. 9075 people

## Apply

3. a. 37638 steps

Use the methods used in **Question 1**.

- b. 3998 steps  
c. 1687 steps  
d. 408 steps

## Mental calculations (pages 20–21)

### Practise

1. a. 3 350

Adding 100 is similar to adding 97, but adding 3 too many.  $253 + 100 = 353$ . The answer is 3 too many, so subtract 3.  $353 - 3 = 350$ .

- b. 1 186      c. 30 340  
d. 2 284      e. 20 280

2. a. 60

Learning multiplication facts allows instant recall.

- b. 56  
c. 8  
Knowing the multiplication facts for 6 allows recall of  $6 \times 8 = 48$ . This is an inverse calculation.  $48 \div 6 = 8$ .

- d. 12      e. 54      f. 9  
g. 9      h. 6      i. 45

3. a.

x	8	6	12
6	48	36	72
9	72	54	108
7	56	42	84

Always work out a multiplication where there is only one number missing. Use the inverse calculation to find missing multipliers.  $36 \div 6 = 6$ . The missing number is 6.

x	8	6	
6		36	72
	72		
7			

Multiply the known multipliers for missing products.  $6 \times 8 = 48$ .

x	8	6	
6	48	36	72
	72		
7			

b.

x	7	4	5
3	21	12	15
12	84	48	60
9	63	36	45

### Extend

4. a. 240

This is 4 tens  $\times 6 = 24$  tens.  $24$  tens = 240.

b. 60

This is 30 tens  $\div 5 = 6$  tens. 6 tens = 60.

c. 70      d. 1800      e. 40      f. 6300

g. 4200      h. 80      i. 4800

5. a. 215

Partition 43.  $43 = 40 + 3$ . Multiply each partition by 5.  $40 \times 5 = 200$ .  $3 \times 5 = 15$ . Recombine the answers to the two multiplications.  $200 + 15 = 215$ .

b. 140      c. 168      d. 189      e. 280

f. 216      g. 276      h. 304      i. 415

6. a. 140

Multiplying three numbers can be done in any order. Arrange the numbers to make the multiplication easier. Only multiply two numbers at a time.  $4 \times 5 = 20$ .  $20 \times 7 = 140$ .

b. 175      c. 144

### Apply

7. a. 490

A function machine performs the same operations on any number that is entered. This function machine performs two operations.

In	Function	Out
80	$\times 6 + 10$	490

Perform the operations to find the output number.  $80 \times 6 = 480$ .  $480 + 10 = 490$ .

b. 60

As the number given is the output number, the calculation must be done in reverse. Perform the inverse operations to find the input number.  $370 - 10 = 360$ .  $360 \div 6 = 60$ .

c. 2410

d. 300

e. 460

f. 80

g. 2380

h. 500

8. a. 60

To find the secret number, work in reverse from the answer one step at a time. Use the inverse calculations. Addition and subtraction are inverse calculations. Multiplication and division are inverse calculations. Secret number  $\times 3 + 50 = 230$ .  $230 - 50 = 180$ .  $180 \div 3 = 60$ . Check that the answer works.  $60 \times 3 + 50 = 230$ .

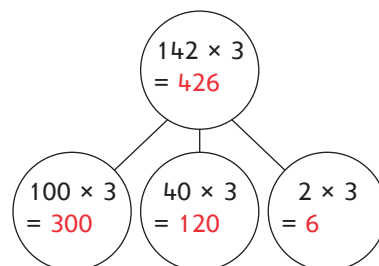
b. 10

c. 800

### Multiplication and division (pages 22–23)

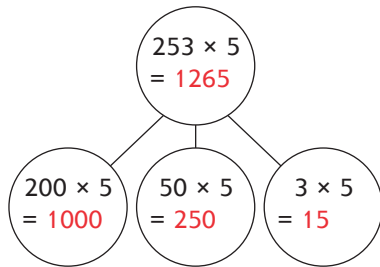
#### Practise

1. a.



Work out the answers needed in the parts of the part-whole model.  $100 \times 3 = 300$ .  $40 \times 3 = 120$ .  $2 \times 3 = 6$ . Add the parts.  $300 + 120 + 6 = 426$ .

b.



2. a. 4    b. 9    c. 8    d. 12    e. 9

f. 12    g. 11    h. 12    i. 8

3. a.  $80 \div 4 = \text{eight tens} \div 4 = \text{two tens} = 20$   
Use the division fact  $8 \div 2 = 4$  to work out  $80 \div 2$ .

b.  $90 \div 3 = \text{nine tens} \div 3 = \text{three tens} = 30$

c.  $100 \div 5 = \text{ten tens} \div 5 = \text{two tens} = 20$

d.  $80 \div 2 = \text{eight tens} \div 2 = \text{four tens} = 40$

### Extend

4. a. 216

Set these multiplications out as column multiplications. Multiply 4 ones by 4.  
 $4 \times 4 = 16$ . This is 1 ten and 6 ones.

$$\begin{array}{r} 5 \ 4 \\ \times \ 4 \\ \hline 6 \\ \hline 1 \end{array}$$

Multiply 5 tens by 4.  $5 \times 4 = 20$  tens. Add the exchanged 1 ten.  $20 \text{ tens} + 1 \text{ ten} = 21 \text{ tens}$ . This is 2 hundreds and 1 ten.

$$\begin{array}{r} 5 \ 4 \\ \times \ 4 \\ \hline 2 \ 1 \ 6 \\ \hline 1 \end{array}$$

b. 180    c. 504

d. 984

Use the method used in **Question 4a**. Continue the multiplication to multiply 3 hundreds by 3.

e. 1904

f. 2562

5. a. 16

Partition these numbers.  $48 = 30 + 18$ . Complete both divisions separately.  $30 \div 3 = 10$ .  $18 \div 3 = 6$ . Recombine the results.  $10 + 6 = 16$ .

b. 19    c. 14    d. 13

e. 18    f. 15

6. a.  $526 \times 3 = 1578$

Do the inverse operation to find the missing numbers.  $1578 \div 3 = 526$ .

b.  $467 \times 4 = 1868$

c.  $285 \times 7 = 1995$

d.  $374 \times 8 = 2992$

### Apply

7. a.

$\times$	19	15	14
4	76	60	56
5	95	75	70
6	114	90	84

Always work out a multiplication where there is only one number missing. Use the inverse calculation to find the missing multipliers.  $60 \div 4 = 15$ .

$\times$		15	
4		60	
5	95		70
6		90	

Multiply the known multipliers for missing products.  $15 \times 5 = 75$ .

$\times$		15	
4		60	
5	95	75	70
6		90	

b.

$\times$	12	17	28
3	36	51	84
5	60	85	140
7	84	119	196

8.

1	2	3	3	4	4	4
4		5	2	0	3	6
0		4		7	4	2
8	1	6			0	2

Calculate each number using the clues and the methods used in **Question 4**.

## Multiplication and division word problems (pages 24–25)

### Practise

1. a. **256 players**  
Read word problems carefully and identify the numbers and operations needed. This word problem uses one step. Multiply the number of teams by the number of players. When multiplying with two-digit numbers, it may be appropriate to use a mental method with jottings. Partition 32, multiply each partition and recombine.  
 $32 = 30 + 2$ .  $30 \times 8 = 240$ .  $2 \times 8 = 16$ .  
 $240 + 16 = 256$ .
- b. **432 cans**
- c. **15 bags**
- d. **512 photographs**
- e. **11 tents**  
Make sure that the answer makes sense in the context of the question.  $65 \div 6 = 10\text{r}5$ . All the children need to be in a tent, so 11 tents are needed.
2. a. **9 and 11**  
Find two numbers that total 20. These could be  $20 + 0$ ,  $19 + 1$ ,  $18 + 2$  and so on. Find the product of each pair of numbers. These could be  $20 \times 0 = 0$ ,  $19 \times 1 = 19$ ,  $18 \times 2 = 36$  and so on. Keep trying pairs until a pair multiply to 99. The answer is 11 and 9.  $11 + 9 = 20$ .  $11 \times 9 = 99$ .
- b. **12 and 3**  
Find two numbers with a difference of 9. These could be  $9 - 0$ ,  $10 - 1$ ,  $11 - 2$  and so on. Find two numbers with a product of 36. These could be  $36 \times 1 = 36$ ,  $18 \times 2 = 36$ ,  $12 \times 3 = 36$  and so on. Keep trying until a pair appears in both lists. The answer is 12 and 3.  $12 - 3 = 9$ .  $12 \times 3 = 36$ .

### Extend

3. a. **21 children**  
This word problem uses two steps. First, multiply the number of children in each class by the number of classes to get the total number of children. Then, divide the total number of children by the number of groups.  
 $28 \times 3 = 84$ .  $84 \div 4 = 21$ .
- b. **144 counters**      c. **29 bags**

4. a.  **$5 \times 6 \times 7$**   
Accept these three numbers in any order. Consecutive numbers come one after the other when counting in ones. Use a trial and improvement method. Try three consecutive numbers and multiply them.  $4 \times 5 \times 6 = 120$ . This is too low. Try another three, but start at a higher number.  $6 \times 7 \times 8 = 336$ . This is too high. Try another three starting with a number higher than 4 but lower than 6.  $5 \times 6 \times 7 = 210$ . These are the three correct numbers.
- b.  **$7 \times 7 \times 7$**   
Use a similar trial and improvement method with three identical numbers.

### Apply

5. a.  **$642 \times 8$**   
Organise the numbers so there are as many large numbers as possible. This would be 6 (hundred)  $\times$  8 or 8 (hundred) by 6. Both answers are 4800. Using the digits 2 and 4 as 42, multiplying by 8 would give a greater product than 42 multiplied by 6. The largest product must be  $642 \times 8$ , which equals 5136.
- b. **6 pizzas**  
Multiply the number of children by the number of slices needed. Divide the total by the number of slices each pizza is cut into.  $15 \times 3 = 45$ .  $45 \div 8 = 5\text{r}5$ . Chen cannot buy part of a pizza, so he buys 6 pizzas.
- c. **250 nails**  
Find the number of nails bought for each option.  $150 \times 5 = 750$ .  $125 \times 8 = 1000$ . Find the difference.  $1000 - 750 = 250$ .
- d. **13 packs**  
Divide the cards by the number of cards in each pack.  $80 \div 6 = 13\text{r}2$ . There will be 13 full packs.

## Hundredths and tenths (pages 26–27)

### Practise

1. a.  **$\frac{5}{10}$  (or  $\frac{1}{2}$ )     $\frac{6}{10}$  (or  $\frac{3}{5}$ )**  
The numerator (top number) of a fraction can be used for counting. The denominator (bottom number) names the type of fraction. In this case, the fractions are tenths. The numerators show that this is a  $+\frac{1}{10}$  sequence.  
 $\frac{4+1}{10} = \frac{5}{10}$ .  $\frac{5}{10}$  can also be written as  $\frac{1}{2}$ .  
 $\frac{5+1}{10} = \frac{6}{10}$ .  $\frac{6}{10}$  can also be written as  $\frac{3}{5}$ .

- b.  $\frac{9}{10}$   $\frac{10}{10}$  (or 1)  
 c.  $1\frac{3}{10}$   $1\frac{4}{10}$  (or  $1\frac{2}{5}$ )  
 d.  $2\frac{10}{100}$  (or  $2\frac{1}{10}$ )  $2\frac{11}{100}$   
 e.  $\frac{6}{100}$  (or  $\frac{3}{50}$ )  $\frac{7}{100}$   
 f.  $\frac{20}{100}$  (or  $\frac{2}{10}$  or  $\frac{1}{5}$ )  $\frac{21}{100}$

2. a.  $\frac{3}{10}$

Here one frame represents a whole or 1.  
 Dividing 1 by 10 =  $\frac{1}{10}$ . 3 sections with counters  
 =  $\frac{3}{10}$ .

b.  $\frac{7}{10}$

c.  $\frac{1}{10}$

d.  $\frac{9}{10}$

3. a.  $\frac{2}{100}$  (or  $\frac{1}{50}$ )

Here one frame represents  $\frac{1}{10}$ . Dividing  $\frac{1}{10}$   
 by 10 =  $\frac{1}{100}$ . Imagine a whole divided into  
 ten parts and then each part divided by 10.  
 There would be 100 parts. 2 sections with  
 shaded circles =  $\frac{2}{100}$ .

b.  $\frac{9}{100}$

c.  $\frac{3}{100}$

d.  $\frac{6}{100}$  (or  $\frac{3}{50}$ )

4. a.  $\frac{9}{100}$

Here, one hundred square represents a whole  
 or 1. Dividing 1 by 100 =  $\frac{1}{100}$ . 9 small,  
 shaded squares =  $\frac{9}{100}$ .

b.  $\frac{21}{100}$     c.  $\frac{57}{100}$     d.  $\frac{99}{100}$

### Extend

5. a.  $\frac{17}{100}$   $\frac{19}{100}$

The numerator (top number) of a fraction can  
 be used for counting. The denominator (bottom  
 number) names the type of fraction. In this  
 case they are hundredths. The numerators  
 show that this is a  $+\frac{1}{100}$  sequence.  $\frac{16+1}{100} =$   
 $\frac{17}{100}$ .  $\frac{18+1}{100} = \frac{19}{100}$ .

b.  $\frac{58}{100}$  (or  $\frac{29}{50}$ )  $\frac{59}{100}$

c.  $1\frac{1}{100}$   $1\frac{2}{100}$  (or  $1\frac{1}{50}$ )

d.  $3\frac{99}{100}$   $4$  (or  $4\frac{0}{100}$ )

6. a.  $\frac{2}{100}$  (or  $\frac{1}{50}$ )

$1 \div 100 = \frac{1}{100}$ . Dividing 2 by 100 will  
 equal  $\frac{2}{100}$ .

b.  $\frac{8}{100}$  (or  $\frac{4}{50}$  or  $\frac{2}{25}$ )

c.  $\frac{12}{100}$  (or  $\frac{6}{50}$  or  $\frac{3}{25}$ )

d.  $\frac{23}{100}$     e.  $\frac{43}{100}$     f.  $\frac{79}{100}$     g.  $\frac{1}{100}$

$\frac{1}{10} \div 10 = \frac{1}{100}$ . Imagine a whole divided into  
 ten parts and then each part divided by 10.  
 There would be 100 parts.

h.  $\frac{7}{100}$

i.  $\frac{3}{100}$

### Apply

7. a. 100

If 1 is divided by a number and the answer is  
 $\frac{1}{100}$ , the number must be 100. If 7 is divided  
 by a number and the answer is  $\frac{7}{100}$ , the  
 number must be 100.

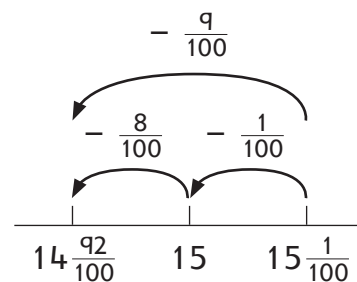
b. 10

If  $\frac{1}{10}$  is divided by a number and the  
 answer is  $\frac{1}{100}$ , the number must be 10.  
 If  $\frac{2}{10}$  is divided by a number and the  
 answer is  $\frac{2}{100}$ , the number must be 10.

c. 83

8. A =  $14\frac{92}{100}$  (or  $14\frac{46}{50}$  or  $14\frac{23}{25}$ )    B =  $14\frac{96}{100}$   
 (or  $14\frac{48}{50}$  or  $14\frac{24}{25}$ )    C =  $15\frac{3}{100}$

Each division on the number line is  $\frac{1}{100}$ . Use the  
 numerators of the fraction to count (forwards  
 or backwards) in hundredths. For example: for  
 A, begin at  $15\frac{1}{100}$  and count back  $\frac{9}{100}$  to get  
 $14\frac{92}{100}$ .



To help count back from 15, exchange 15  
 for  $14\frac{100}{100}$ .

9.  $\frac{1}{100}$

## Equivalent fractions (pages 28–29)

### Practise

1. a.  $\frac{2}{3} = \frac{4}{6} = \frac{6}{9} = \frac{8}{12}$

Accept any three equivalent fractions in addition to  $\frac{2}{3}$ . Write the number of shaded sections as a fraction of the total number of sections. There are 2 shaded sections out of 3 sections. This is  $\frac{2}{3}$ . Multiply the numerators and denominators by the same numbers to find other equivalent fractions. For example: multiply them by 2, 3 and 4 to get  $\frac{4}{6}$ ,  $\frac{6}{9}$  and  $\frac{8}{12}$ .

b.  $\frac{3}{4} = \frac{6}{8} = \frac{9}{12} = \frac{12}{16}$

Accept any three equivalent fractions in addition to  $\frac{3}{4}$ .

c.  $\frac{3}{8} = \frac{6}{16} = \frac{9}{24} = \frac{12}{32}$

Accept any three equivalent fractions in addition to  $\frac{3}{8}$ .

d.  $\frac{4}{5} = \frac{8}{10} = \frac{12}{15} = \frac{16}{20}$

Accept any three equivalent fractions in addition to  $\frac{4}{5}$ .

2. a.  $\frac{1}{5} = \frac{2}{10} = \frac{3}{15} = \frac{4}{20}$

Use the fifths row on the fraction wall and count along one from the left. Find other equivalent fractions by following the right-hand edge of  $\frac{1}{5}$  and looking for other fractions that are the same size.

b.  $\frac{3}{10} = \frac{6}{20}$

c.  $\frac{3}{5} = \frac{6}{10} = \frac{9}{15} = \frac{12}{20}$

d.  $\frac{18}{20} = \frac{9}{10}$

### Extend

3. a. A =  $\frac{3}{6} = \frac{6}{12}$  B =  $\frac{5}{6} = \frac{10}{12}$

The number line has 6 divisions above it. It is divided into sixths. The number line has 12 divisions below it. It is divided into twelfths. Check the fractions indicated by the arrows. Above the line, the fractions indicated are  $\frac{3}{6}$  and  $\frac{5}{6}$ . Below the line, the same fractions are  $\frac{6}{12}$  and  $\frac{10}{12}$ .

b. C =  $\frac{1}{3} = \frac{6}{18}$  D =  $\frac{2}{3} = \frac{12}{18}$

4. a.  $\frac{16}{20} = \frac{20}{25} = \frac{24}{30}$

Find the equivalent fractions by using the sequences of numerators and denominators. The numerators are the multiples of 4.

The denominators are the multiples of 5. Continue the sequences for the missing equivalent fractions.

b.  $\frac{20}{32} = \frac{25}{40} = \frac{30}{48}$

c.  $\frac{20}{24} = \frac{25}{30} = \frac{30}{36}$

d.  $\frac{28}{40} = \frac{35}{50} = \frac{42}{60}$

### Apply

5. a.  $\frac{15}{20}$

The equivalent fraction for  $\frac{3}{4}$  has a missing denominator. Check how the numerator has changed. The numerator has been multiplied by 5. Increase the denominator in the same way.  $\frac{3}{4} = \frac{3 \times 5}{4 \times 5} = \frac{15}{20}$ .

b.  $\frac{12}{20}$  c.  $\frac{27}{30}$  d.  $\frac{6}{36}$  e.  $\frac{16}{40}$  f.  $\frac{10}{24}$

6. a.  $\frac{45}{72} = \frac{50}{80} = \frac{55}{88}$

The numerator of the equivalent fraction is between 41 and 59. The numerator must be a multiple of 5. This means the numerator could be 45, 50 or 55. For each possible numerator of the equivalent fraction, work out what the original numerator needs to be multiplied by to be one of these numbers. Then multiply the denominator by the same number.  $45 \div 5 = 9$ . The numerator has been multiplied by 9.  $\frac{5}{8} = \frac{5 \times 9}{8 \times 9} = \frac{45}{72}$ .  $50 \div 5 = 10$ . The numerator has been multiplied by 10.  $\frac{5}{8} = \frac{5 \times 10}{8 \times 10} = \frac{50}{80}$ .  $55 \div 5 = 11$ . The numerator has been multiplied by 11.  $\frac{5}{8} = \frac{5 \times 11}{8 \times 11} = \frac{55}{88}$ .

b.  $\frac{42}{60} = \frac{49}{70} = \frac{56}{80}$

7. a.  $\frac{35}{40} = \frac{42}{48} = \frac{49}{56}$  b.  $\frac{36}{40} = \frac{45}{50}$

## Adding and subtracting fractions (pages 30–31)

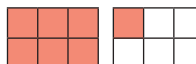
### Practise

1. a.  $\frac{5}{8}$  

The calculation is  $\frac{7}{8} - \frac{2}{8} = \frac{7-2}{8} = \frac{5}{8}$ . Shade 5 squares to represent the answer.

b.  $\frac{5}{6}$  

c.  $\frac{1}{8}$  

d.  $1\frac{1}{6}$  

2. a.  $1\frac{3}{10}$

Use the number line to complete the calculation. Count forwards (right) six steps and then four steps from  $\frac{3}{10}$ .  $\frac{3}{10} + \frac{3}{10} + \frac{6}{10} + \frac{4}{10} = 1\frac{3}{10}$ .

b.  $1\frac{7}{10}$

c.  $\frac{3}{10}$

Use the number line to help complete the calculation. Count backwards (left) four steps from  $\frac{7}{10}$ .  $\frac{7}{10} - \frac{4}{10} = \frac{3}{10}$ .

d.  $\frac{7}{10}$

3. a.  $\frac{3}{10}$

The numerator (top number) is used to add and subtract fractions. The denominator (bottom number) stays the same. Subtract 6 from 9.  $\frac{9}{10} - \frac{6}{10} = \frac{3}{10}$ .

b.  $1\frac{2}{8}$  (or  $1\frac{1}{4}$ )

c.  $1\frac{2}{5}$

$\frac{3}{5} + \frac{4}{5} = \frac{7}{5}$ . Since there are more than  $\frac{5}{5}$ , the answer is greater than 1.  $\frac{5}{5}$  is the same as 1, so take that out of the fraction.  $\frac{2}{5}$  are left, so the answer is  $1\frac{2}{5}$ . Remember that a whole number and fraction together is called a mixed number.

d.  $2\frac{4}{5}$

### Extend

4. a.  $1\frac{1}{15}$

To complete the part-whole model, add the two parts.  $\frac{7}{15} + \frac{9}{15} = \frac{7+9}{15} = \frac{16}{15} = 1\frac{1}{15}$ .

b.  $\frac{7}{12}$

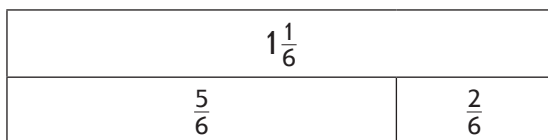
To complete the part-whole model, subtract the known part from the whole. Change the whole into an improper fraction  $1\frac{5}{12} = \frac{12}{12} + \frac{5}{12} = \frac{17}{12}$ . Subtract the part.  $\frac{17}{12} - \frac{10}{12} = \frac{7}{12}$ .

c.  $1\frac{2}{3}$

d.  $2\frac{3}{10}$

5. a.  $\frac{2}{6}$  (or  $\frac{1}{3}$ )

A fraction is added to  $\frac{5}{6}$  to make  $1\frac{1}{6}$ . This can be shown as a bar model.



Subtract  $\frac{5}{6}$  from  $1\frac{1}{6}$ . Convert the mixed number into an improper fraction first.

$$1\frac{1}{6} = \frac{7}{6} - \frac{5}{6} = \frac{2}{6}$$

b.  $\frac{7}{10}$

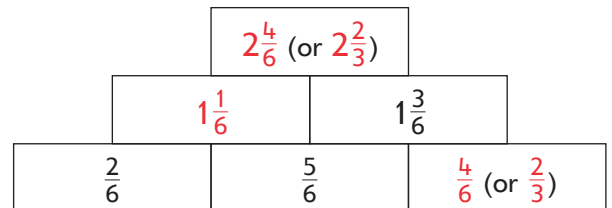
c.  $\frac{9}{12}$  (or  $\frac{3}{4}$ )

d.  $\frac{5}{8}$

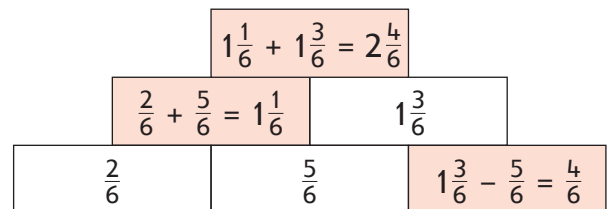
e.  $\frac{5}{6}$

f.  $\frac{13}{15}$

6.



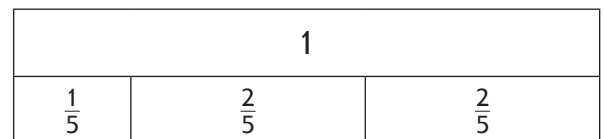
There are three separate calculations.



### Apply

7.  $\frac{2}{5}$

Read word problems carefully and decide on the numbers and operations needed. This problem can be shown as a bar model.



Add the known parts and then subtract from the whole.  $\frac{1}{5} + \frac{2}{5} = \frac{3}{5}$ . Subtract the total of the two known parts from the whole.  $1 - \frac{3}{5} = \frac{2}{5}$ .

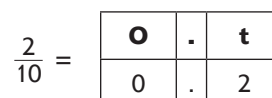
8.  $\frac{5}{6}$

### Fraction and decimal equivalents (pages 32–33)

#### Practise

1. a. 0.2

Use the number of tenths. This is the numerator. Write the digit in the place value column for tenths.



Add a zero in the ones place value column and a decimal point in the decimal point column. This makes sure the 2 appears in the tenths place value column.

- b. 0.6  
c. 0.9

2. 0.5

Count the number of tenths equivalent to one-half.  $\frac{1}{2} = \frac{5}{10}$ . Write the five in the place value column for tenths.  $\frac{5}{10} = 0.5$ .

3. a. >

Either change the fractions to decimals or the decimals to fractions so that both are in the same format. For example:  $\frac{2}{10} = 0.2$ . Compare the numbers.  $0.3 > 0.2$ .

- b. =    c. <    d. <    e. <    f. >

### Extend

4. a. 0.03

Use the number of hundredths. This is the numerator. Write the digit in the place value column for hundredths.

O	.	t	h
0	.	0	3

Add zeros in the ones and tenths place value columns and a decimal point in the decimal point column. This makes sure that the 3 appears in the hundredths place value column.

- b. 0.07  
c. 0.1 (or 0.10)  
d. 0.29

$\frac{29}{100} = \frac{20}{100} + \frac{9}{100} = \frac{2}{10} + \frac{9}{100}$ . Write the digit 2 in the place value column for tenths and the digit 9 in the place value column for hundredths.

O	.	t	h
0	.	2	9

- e. 0.53  
f. 0.93  
5. a. 0.25  
The number line shows that  $\frac{1}{4}$  is the same as  $\frac{25}{100}$ .  $\frac{20}{100} + \frac{5}{100} = \frac{2}{10} + \frac{5}{100} = 0.25$ .  
b. 0.75

### Apply

6. a.  $1\frac{31}{100} = 1.31$

O	.	t	h
●	.	● ● ●	●

Change each set of counters for a number in the correct place value column.

b.  $2\frac{45}{100} = 2.45$

c.  $\frac{27}{100} = 0.27$

d.  $1\frac{3}{100} = 1.03$

7. a.  $\frac{73}{100} = 0.73$

$$\frac{7}{10} + \frac{3}{100} = \frac{70}{100} + \frac{3}{100} = \frac{73}{100} = \frac{7}{10} + \frac{3}{100} = 0.73.$$

b.  $\frac{4}{10} + \frac{3}{100} = \frac{43}{100}$

c.  $\frac{97}{100} = 0.97$

d.  $\frac{6}{10} + \frac{1}{100} = \frac{61}{100}$

### Rounding decimals (pages 34–35)

#### Practise

1. a. 5

The number 5.3 comes between the two whole numbers 5 and 6. The digit in the tenths column is 3, so 5.3 is rounded down. The nearest whole number is 5.

- b. 6    c. 6    d. 5    e. 7  
f. 3    g. 10    h. 11

2. a. 14

Use the number line in the question. 13.8 comes between the two whole numbers 13 and 14. The digit in the tenths column is 8, so 13.8 is rounded up. The nearest whole number is 14.

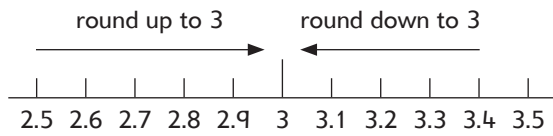
- b. 14    c. 15    d. 16    e. 17    f. 28  
g. 29    h. 30    i. 30    j. 31

#### Extend

3. a. (3.2) (2.6) (3.4)

Numbers with one decimal place equal to or greater than 2.5 but less than 3.5 will all be rounded to 3 as the nearest whole number. The number line shows the numbers with one decimal place and how they will round to 3.

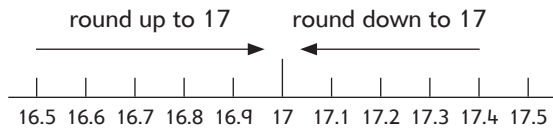




- b. **19.8**   **20.2**   **19.6**

4. a. **16.5**

Numbers with one decimal place equal to or greater than 16.5 but less than 17.5 will all be rounded to 17 as the nearest whole number. The number line shows the numbers with one decimal place and how they will round to 17.



- b. **9.5**  
c. **24.5**

5. a. **28.4**   b. **40.4**   c. **69.4**

### Apply

6. a. **6.7** or **7.3** or **7.4**

Numbers with one decimal place that round to 7 must be equal to or greater than 6.5 and less than 7.5. Use the cards to make numbers that are in this set. If there is a 6 in the ones column, the only digit that can be used as tenths is 7 to make 6.7. If there is a 7 in the ones column, the only digits that can be used as tenths are 3 or 4 to make 7.3 and 7.4.

- b. **6.3** or **6.4**

7. a. **8.3**

Read the clues carefully. The only number that satisfies all the clues is 8.3. It is less than 10. A tenths digit that is odd and greater than 1 but less than 9 must be 3, 5 or 7. The number rounds down to 8 to the nearest whole number. The number must be 8.3, 8.5 or 8.7 as it only has one decimal place. Only 8.3 would round down to 8.

- b. **23.8**  
c. **22.8**

## Comparing and ordering decimals (pages 36–37)

### Practise

1. a. **4**

Look at the place value of all the digits. The numbers with the greatest value have

the highest value digits in the ones column. 4 is the only number with 4 ones, so it is the largest number.

- b. **10.1**   c. **12.64**   d. **24.11**

2. a. Accept any two from **0.4**, **1.3** or **2.2**.

There are 4 counters used. To make a smaller number using 4 counters there must be fewer than 3 ones. It could be 2 ones, which means 2 counters in the tenths column, making 2.2. It could be 1 one, which means 3 counters in the tenths column, making 1.3. It could be 0 ones, which means 4 counters in the tenths column, making 0.4.

- b. **0.5** and **1.4**

3. a. Accept **0**, **1**, **2**, **3** or **4** in the tenths column.

Both numbers have a 0 in the ones column. The number in the tenths column must be less than 5 to make the number smaller. The tenths digit could be: 0, 1, 2, 3 or 4.

- b. Accept **0**, **1**, **2** or **3** in the hundredths column.

- c. Accept **6**, **7**, **8** or **9** in the hundredths column.

- d. Accept **0**, **1**, **2**, **3** or **4** in the tenths column.

- e. Accept **3**, **2**, **1** or **0** in the hundredths column.

- f. Accept **2**, **1** or **0** in the tenths column.

### Extend

4. a. **7.89**

Look at the place value of all the digits. The numbers with the least value have the smallest value digits in the column to the left. 7.89 is the only number with 7 ones, so it is the smallest number.

- b. **14.7**   c. **34.98**   d. **39.56**

5. a. **5.6 < 8.7** or **6.5 < 7.8** or **7.6 < 8.5**

Accept any other correct answer where the ones digit for the number on the left is smaller than the ones digit for the number on the right. Remember, < means 'less than' and > means 'greater than'.

- b. **5 < 6.78** or **6 < 8.57** or **7 < 8.65**

Answers will vary. Accept any correct answer where the ones digit for the number on the left is less than the ones digit for the number on the right.

- c. **6 > 5.87** or **7 > 6.58** or **8 > 5.67**

Answers will vary. Accept any correct answer where the ones digit for the number on the left is greater than the ones digit for the number on the right.

- d.  $0.56 < 0.78$  or  $0.65 < 0.87$  or  $0.75 < 0.86$   
 Answers will vary. Accept any correct answer where the tenths digit for the number on the left is less than the tenths digit for the number on the right.

## Apply

6. a. **Dev**  
 Use two decimal places for all the numbers, so 1.3m would become 1.30m and 1.2m would become 1.20m. Compare all the heights using place value. All the numbers have 1 one. Three numbers have 3 tenths (1.30, 1.31 and 1.35). These are larger than the numbers with 2 tenths (1.28 and 1.20). Of the numbers with 3 tenths, 1.35 has 5 hundredths and the others have less than this. Dev is the tallest.
- b. **Eric**
7. **0.3 litres, 0.35 litres, 0.39 litres, 0.4 litres, 0.41 litres**  
 Use the method used in **Question 6**.

## Multiplying and dividing by 10 and 100 (pages 38–39)

### Practise

1. a. 

H	T	O	.	t	h
●	●●●	●	.	●●	

  
 (or 131.4)  
 To multiply by 10, move all the counters one column to the left.
- b. 

H	T	O	.	t	h
●●		●●●	.		

  
 (or 405)
- c. 

H	T	O	.	t	h
	●●		.	●●	●●

  
 (or 20.34)
2. 

1000	3000	5000	7000	9000
100	300	500	700	900
10	30	50	70	90
1	3	5	7	9

Multiply or divide the numbers by 10 or 100 to complete the table. The digits will move one place value column to the left or right when multiplying or dividing by 10 and two place value columns to the left or right when multiplying or dividing by 100.

3. a. **0.51**  
 Use the method used in **Question 2**. Remember, digits may move across the decimal point.

T	O	.	t	h
	5	.	1	

↙ ↘

	0	.	5	1
--	---	---	---	---

$5.1 \div 10 = 0.51$ . Add a placeholder 0 in the ones place value column.

- b. **1.28**  
 c. **2030**  
 Use the method used in **Question 2**. Remember that digits may move across the decimal point.

Th	H	T	O	.	t
		2	0	.	3

↙ ↘ ↙ ↘ ↙ ↘

2	0	3	0	.	
---	---	---	---	---	--

$20.3 \times 100 = 2030$ . Add a placeholder 0 in the ones place value column.

- d. **76**   e. **40.6**   f. **5.09**

### Extend

4. a. **100**  
 Check to see how many place value columns the digits have moved and in which direction.

T	O	.	t	h
5	4	.		

↘ ↘

	0	.	5	4
--	---	---	---	---

The digits have moved right, so the calculation is a division. The digits have moved two place value columns to the right, so the calculation is a division by 100.

- b. **10**   c. **100**   d. **10**  
 e. **10**   f. **100**

5. a. 100

Work out the value of each calculation. Each side of the equals sign must be the same.

$$0.56 \times 10 = 5.6. \quad 560 \div ? = 5.6.$$

H	T	O	.	t	h
5	6	0	.		

		5	.	6	
--	--	---	---	---	--

The digits have moved two places to the right. The number has been divided by 100.

b. 23      c. 10.8      d. 7.09

6. a. <

Work out the value of each calculation.  $415 \div 10 = 41.5$ .  $4.15 \times 100 = 415$ .  $41.5 < 415$ .

b. =      c. >      d. =

### Apply

7. a.  $5.38 \times 10 = 538 \div 10$

Work out the value of each calculation. Each side of the equals sign must be the same.  $5.?8 \times 10 = 53?$ .  $5.?8 \div 10 = 53.?$ .  $5.?8 \times 10 = 53.?$ . Find the missing digits by comparing the two numbers, remembering both numbers are now the same. The missing digits must be 3 and 8.

b.  $7.02 \times 10 = 7020 \div 100$

8. a. 600cm

Use the scale of 1cm = 100cm. 1cm on the plan equals 100cm in real life. Any measurement on the plan must be multiplied by 100 to find the real-life measurement.  $6\text{cm} \times 100 = 600\text{cm}$ .

b. 850cm      c. 275cm

9. a. £4.15

Remember 100p = £1. To change pence into pounds, divide by 100.  $415\text{p} \div 100 = £4.15$ .

b. £10.57      c. £24.08

## Fractions word problems (pages 40–41)

### Practise

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

Convert 0.75 to a fraction. 0.75 is the same as  $\frac{75}{100}$ . Both numbers can be divided by 25 to make  $\frac{3}{4}$ . It is useful to learn that  $0.75 = \frac{3}{4}$ .

b.  $\frac{7}{100}$

c. 0.5

d. 29km

e. i. 0.17kg

ii. 0.83kg

f.  $\frac{2}{5}$

g.  $\frac{2}{5}$

### Extend

2. a. i.  $\frac{1}{5}$

The flags are placed every 100m and the race is 500m in total. The fraction is  $\frac{100}{500}$ . Both numbers can be divided by 100.

$$\frac{100}{500} = \frac{1}{5}$$

ii.  $\frac{1}{10}$

The flags are placed every 100m. There are 1000m in 1km. The fraction is  $\frac{100}{1000}$ . Both numbers can be divided by 100.

$$\frac{100}{1000} = \frac{1}{10}$$

b.  $\frac{5}{12}$

c. £26.70

d. 58.3m

### Apply

3. a.  $\frac{3}{10}$

b. 1st: Isaac (or 11.09 sec)    2nd: Laura (or 11.1 sec)    3rd: Farida (or 11.4 sec)

c. 305

The number cards say 3 ones and 5 hundredths, which can be written as 3.05. This is the answer when the original number has been divided by 100. Use the inverse operation and multiply 3.05 by 100 to find the original number.  $3.05 \times 100 = 305$ .

d. 3 pizzas

$\frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3} = \frac{8}{3} = 2\frac{2}{3}$ . To eat  $2\frac{2}{3}$  pizzas, the children must have had at least 3 pizzas.

## Finding fractions (pages 42–43)

### Practise

1. a. 3

Fractions with a numerator of 1 are called unit fractions. For example:  $\frac{1}{5}$ . Find  $\frac{1}{5}$  of 15 by dividing 15 by 5.  $15 \div 5 = 3$ .

- b. 6      c. 8      d. 4      e. 3  
f. 2      g. 12      h. 12      i. 12

2. a. 15 blue counters  
b. 12 red counters

3. a. 24 green apples  
Find the number of green apples by dividing 72 by 3.  $72 \div 3 = 24$ .  
b. 48 red apples  
There are 24 green apples. The rest of the 72 apples are red. Subtract 24 from 72.  $72 - 24 = 48$ .

4. a. 40 passengers  
b. 200 passengers

### Extend

5. a. 6  
Finding  $\frac{2}{5}$  of a number is a two-step calculation. Find  $\frac{1}{5}$  of 15 by dividing 15 by 5. Then find  $\frac{2}{5}$  of 15 by multiplying  $\frac{1}{5}$  of 15 by 2.  $15 \div 5 = 3$ .  $3 \times 2 = 6$ .  
b. 24      c. 24      d. 9      e. 25      f. 49

6. 36 children

7. 9 questions  
This is a multi-step calculation. First, find the number of questions answered on Friday and Saturday using the fractions.  $40 \div 5 \times 2 = 16$ .  $40 \div 8 \times 3 = 15$ .  $16 + 15 = 31$ . Then subtract the number of questions answered on Friday and Saturday from the total number of questions.  $40 - 31 = 9$ .

8. 9 T-shirts  
This is a multi-step calculation. First, find out how many of the 30 T-shirts are blue using the fraction.  $30 \div 5 \times 2 = 12$ . Then find out how many of the blue T-shirts are medium using the fraction.  $12 \div 4 \times 3 = 9$ .

### Apply

9. a. 3

8			
$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
2	2	2	2

Find the missing numerator. 8 has been divided into quarters.  $8 \div 4 = 2$ .  $\frac{1}{4}$  of 8 = 2.  $3 \times 2 = 6$ . So 3 quarters ( $\frac{3}{4}$ ) of 8 must equal 6.

- b. 5

15				
3	3	3	3	3
$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$

Find the missing denominator. The answer 9 comes from multiplying a number by the numerator 3.  $9 \div 3 = 3$ .  $\frac{1}{?}$  of 15 = 3.  $15 \div 3 = 5$ . 15 must have been divided into 5 parts. Each part must be  $\frac{1}{5}$  and  $\frac{3}{5}$  of 15 = 9.

- c. 16

6							
$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
2	2	2	2	2	2	2	2
16							

Find the missing whole. If  $\frac{3}{8}$  of the number = 6, 6 must come from multiplying  $\frac{1}{8}$  of the number by 3. Divide 6 by 3 to get  $\frac{1}{8}$  and multiply the result by 8 to find the original number.  $6 \div 3 = 2$ .  $2 \times 8 = 16$ .

- d. 15      e. 15      f. 64

10.  $\frac{21}{50}$

Find  $\frac{7}{10}$  of 50 to find Syed's marks.  $50 \div 10 \times 7 = 35$ . Subtract 14 from Syed's score to find Cole's marks.  $35 - 14 = 21$ . Cole's score is 21 out of 50, which is  $\frac{21}{50}$  as a fraction.

11.  $\frac{1}{3}$  of 24 = 8,  $\frac{1}{4}$  of 24 = 6,  $\frac{1}{2}$  of 24 = 12,  $8 + 6 + 12 = 26$  and there are only 24 cards. or  $\frac{1}{3} + \frac{1}{4} + \frac{1}{2} = 1\frac{1}{12}$ , which is more than 1.

Accept any explanation that explains this would be more than 24 cards or more than 1 whole and so is not possible.

12. 2 pizzas

1 pizza	1 pizza	1 pizza	1 pizza	1 pizza
Pieces eaten				
1 pizza	1 pizza			

5 pizzas cut into quarters will give 20 pieces. Each piece is one quarter, so 5 pizzas is 20 quarters ( $\frac{20}{4}$ ). Subtract the 12 pieces eaten.  $\frac{20}{4} - \frac{12}{4} = \frac{8}{4} = 2$ .

## Calculating with decimals (pages 44–45)

### Practise

1. a. 83.7

Use column addition. Keep the decimal points in a vertical line.

$$\begin{array}{r} 51.4 \\ + 32.3 \\ \hline 83.7 \end{array}$$

b. 13.4

Use column subtraction. Keep the decimal points in a vertical line.

$$\begin{array}{r} 36.9 \\ - 23.5 \\ \hline 13.4 \end{array}$$

c. 3.89

d. 2.24

e. 88.8

f. 53.3

2. a. 1.3 metres

b. £8.10

c. 6.3 litres

d. 5.25kg

### Extend

3. a. 41.39

Use column addition. Keep the decimal points in a vertical line. Keep digits with the same place value in the same column.

$$\begin{array}{r} 35.89 \\ + 5.5 \\ \hline 41.39 \\ \hline 11 \end{array}$$

b. 52.16

Use column subtraction. Keep the decimal points in a vertical line. Keep digits with the same place value in the same column. Adding a 0 in the empty place value column can help with the subtraction.

$$\begin{array}{r} 53.76 \\ - 1.60 \\ \hline 52.16 \end{array}$$

c. 3.78

d. 40.56

e. 44.64

f. 35.24

4. a. £39.75

b. 2.25 litres

c. 2.3km

### Apply

5. a. 7.9

Find the missing number using the inverse calculation. This will be a subtraction.

$$\begin{array}{r} 513 \\ 64.37 \\ - 56.47 \\ \hline 7.90 \end{array}$$

b. 60.4

Find the missing number using the inverse calculation. This will be an addition.

$$\begin{array}{r} 23.5 \\ + 36.9 \\ \hline 60.4 \\ \hline 11 \end{array}$$

c. 4.92

Find the missing number using the inverse calculation. This will be a subtraction. Adding a 0 in the empty place value column can help with the subtraction.

$$\begin{array}{r} 011 \\ 42.32 \\ - 7.40 \\ \hline 4.92 \end{array}$$

d. 20.74

6. a. 50p

b. £7.75

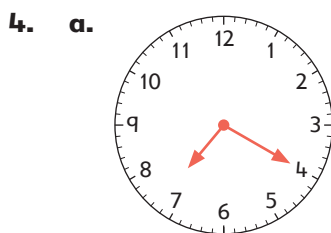
Divide 31 by 4.  $31 \div 4 = 7r.3$ . This is £3 left over. Divide the r.3 by 4. Divide each £1 by 4.  $\pounds 1 \div 4 = 25p$ .  $\frac{1}{4}$  of £3 is the same as taking  $\frac{1}{4}$  of each £1.  $25p \times 3 = 75p$ .

£1				£1				£1			
25p	25p	25p	25p	25p	25p	25p	25p	25p	25p	25p	25p

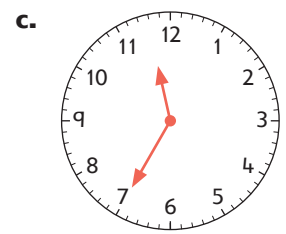
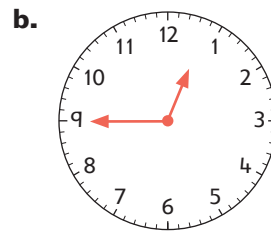
## 12-hour time (pages 46–47)

### Practise

- 9:25 p.m.**  
The time on the clock is 25 minutes past 9 in the evening. Write this in 12-hour time. Because this is in the evening, it must be after midday, so use p.m. The first number in the 12-hour time is the previous o'clock, which is 9. The second number in the 12-hour time is the minutes past the previous o'clock, which is 25.
  - 11:03 a.m.**  
Remember to put a zero in the tens column if there are fewer than 10 minutes.
  - 3:43 p.m.**
- 7:10 a.m.**  
Use the method used in **Question 1**.
  - 4:30 p.m.**      **c. 6:55 p.m.**
- 12 (twelve) minutes past 7 (seven) (in the evening)**  
Answers can be written using numerals or words for the numbers. This time is before the half hour, so it is said to be 'past' the previous o'clock. Use the digits in the 12-hour time. 7 is the previous o'clock. 12 is the number of minutes past the previous o'clock. p.m. means it is after midday and, as the previous o'clock was 7, it is in the evening.
  - quarter to 10 (ten) (in the morning)**  
This time is after the half hour, so it is said to be 'to' the next o'clock.
  - 25 (twenty-five) minutes to 3 (three) (in the afternoon)**



Add the hour hand. The time is after 7, so the hour hand must be between 7 and 8. As it is 20 minutes past, this is one-third of an hour, so the minute hand will be one-third of the way from 7 to 8. Add the minute hand. The time is 20 minutes past, so count 20 minutes from the position of the previous o'clock (12). The numbers on the clock face are 5 minutes apart, so the minute hand will be pointing to 4.

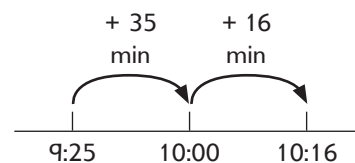


### Extend

- 1:33 p.m.**  
If the time shown on the clock is 10 min slow, this means that the time on the clock is 10 min behind the actual time. The time shown on the clock is 1:23 in the afternoon, so add 10 min on to the time. 1:23 p.m. + 10 min = 1:33 p.m.
  - 8:21 a.m.**
- 10 minutes slow**  
Find the difference between the two times given. The time on the clock is 5 minutes to 5, so the time difference is 10 min. Decide whether the time on the clock is ahead of or behind the actual time. The time on the clock is behind the actual time, so the clock is slow.
  - 19 minutes slow**      **c. 15 minutes fast**

### Apply

- 51 min**  
Change the times so they both use the same format. 25 minutes past 9 is 9:25 and the time on the clock is 10:16. Use a number line to count up from the earlier time.



Add the steps together. 35 min + 16 min = 51 min.

- 53 min**

## 24-hour time (pages 48–49)

### Practise

- 06:05**  
The time on the clock is 5 minutes past 6 in the morning. Write this in 24-hour time. The first number uses two digits and is the previous o'clock, which is 06 because it is a morning time. The second number is the minutes past the previous o'clock, which is 05. Write these in order with a separator, checking there are always four digits.

b. 13:28

The time on the clock is 28 minutes past 1 in the afternoon. Write this in 24-hour time. The first number uses two digits and is the previous o'clock, which is 13 because this is an afternoon time (12 + 1). The second number is the minutes past the previous o'clock, which is 28. Write these in order with a separator, checking there are always four digits.

c. 23:35

2. a. 10:25

Use the method used in **Question 1**.

b. 15:15

c. 19:25

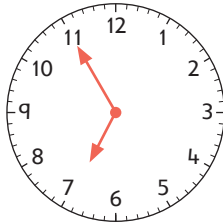
3. a. 24 (twenty-four) minutes past 5 (five) (in the afternoon/evening)

Answers can be written using numerals or words for the numbers. The time is 17:24. 17 is the previous o'clock, which is 5 in the afternoon (17 - 12 = 5). The minutes past the previous o'clock (24) stay the same.

b. 19 (nineteen) minutes to 10 (ten) (in the morning)

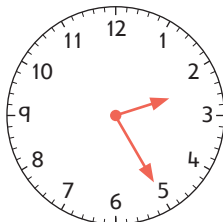
c. 1 (one) minute to 10 (ten) (in the evening/at night)

4. a.

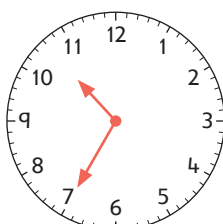


18:55 is 55 minutes past 6, usually said as 5 minutes to 7. Add the hour hand. It will be pointing just before the number 7 as it is not yet 7 o'clock. Add the minute hand. It will be pointing to the number 11, showing 5 minutes to the next o'clock.

b.



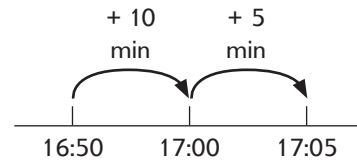
c.



## Extend

5. a. 17:05

If the time shown on the clock is 15 min slow, this means that the time on the clock is 15 min behind the actual time. The time shown on the clock is 10 minutes to 5 in the afternoon. Change this time into 24-hour time, which is 16:50. Add 15 min on to the time. Partition 15 minutes as 10 min + 5 min. Add each partition on a number line.



b. 06:55

6. a. 25 minutes slow

Find the difference between the two times given. The time on the clock is twelve minutes to six, which makes a time difference of 25 min. Decide whether the time on the clock is ahead of or behind the actual time. The time on the clock is behind the actual time, so the clock is slow.

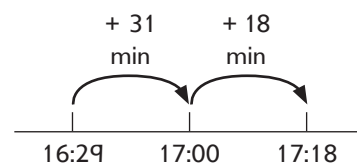
b. 91 minutes fast

c. 75 minutes slow

## Apply

7. a. 49 min

Change the times so they both use the same format. The time on the clock is 16:29 and the actual time is 17:18. Use a number line to count up from the earlier time.



Add the steps together. 31 min + 18 min = 49 min.

b. 48 min

## Time problems (pages 50–51)

### Practise

1. a. 300 seconds

To change larger units to smaller units, multiply by the number of units need to make the larger unit. Multiply 5 min by 60 sec.  $5 \times 60 \text{ sec} = 300 \text{ sec}$ .

b. 48 hours

- c. 28 days
  - d. 480 minutes
  - e. 2 hours
  - f. 3 weeks
2. a. 11:03 or 11:03 a.m. or 3 minutes past 11  
Read word problems carefully and identify the numbers and operations needed. These problems are based on the pages about time (pages 46–49). It may be useful to refer back to them. Partition 100 min into 60 min (1 hr) + 40 min to add it to 09:23. Use a number line to help if necessary.  $09:23 + 1 \text{ hr} = 10:23$ .  $10:23 + 40 \text{ min} = 11:03$ .
- b. 10:45 a.m.
  - c. 17:37
  - d. 23 min
  - e. 15:30 or 3:30 p.m. or half past 3

### Extend

3. a. 210 seconds  
b. 165 minutes  
c. 4 days 4 hours  
d. 4 weeks 3 days
4. a. 44 min      b. 4 hr 55 min  
c. 22:25 or 10:25 p.m. or 25 minutes past 10 in the evening

### Apply

5. No, because there would be at least one leap year in 10 years, so there would be at least 3651 days.  
Accept an explanation that shows Lily is not correct as there would be at least one leap year in this time. Accept answers stating any number of leap years between 1 and 3 in 10 years. Note that there is normally a leap year every four years (when a year is divisible by four). There is not a leap year on a year that is divisible by 100 (such as 1900). However, years that are divisible by 400 are leap years (such as 2000). This means that there might be three extra days (from 2020 to 2029, the leap years are 2020, 2024 and 2028), two extra days (from 2017 to 2026, the leap years are 2020 and 2024) or one extra day (from 1897 to 1906, only 1904 is a leap year).
6. a. 10 rides  
b. 2 min 10 sec

## Money problems (pages 52–53)

### Practise

1. a. £14  
 $£10 + £2 + 50\text{p} + 50\text{p} + 50\text{p} + 20\text{p} + 20\text{p} + 20\text{p} = £14.10$ . £14.10 is between £14 and £15 and is rounded to £14 as the nearest whole pound.
- b. £11
2. a. £4.08  
When using the pound sign, money must always be written with two digits to show the pence. To change pence to pounds, divide by 100.  $408\text{p} \div 100 = £4.08$ .
- b. £10.50
- c. £21.70
- d. £6.40  
Do not accept £6.4.
3. a. >  
Change the units to be the same.  $1280\text{p} = £12.80$ .  $£12.80 > £12.08$ .
- b. <      c. <      d. =

### Extend

4. a. £6.25  
b. £21.15  
c. £3.80  
Do not accept £3.8.  
d. £35.49

5.

80p	£3.60	£1.60
£2.80	£2	£1.20
£2.40	40p	£3.20

### Apply

6. a. £1, 50p, 2p, 2p, 1p  
b. £1, 20p, 20p, 10p, 5p  
Accept answers in either order.
7. a. £123.50  
A ticket for 2 adults + 2 children costs £100 and a ticket for 1 child costs £23.50.  $£100 + £23.50 = £123.50$ .
- b. £40.50



## Converting units of measurement (pages 54–55)

### Practise

1. a. 5000g  
To change larger units to smaller units, multiply by the number of units needed to make the larger unit. Multiply 5kg by 1000.  $5\text{kg} \times 1000 = 5000\text{g}$ .
- b. 40mm      c. 7000ml
- d. 5m  
To change smaller units to larger units, divide by the number of units needed to make the larger unit. Divide 500cm by 100.  $500\text{cm} \div 100 = 5\text{m}$ .
- e. 6km      f. 5cm      g. 3 litres  
h. 10000m      i. 2kg      j. 1000cm
2. a. 15000m  
To change larger units to smaller units, multiply by the number of units needed to make the larger unit. Multiply 15km by 1000.  $15\text{km} \times 1000 = 15000\text{m}$ .
- b. 40cm      c. 20 litres      d. 650cm  
e. 2800m      f. 77mm      g. 7500ml  
h. 2300m      i. 250g      j. 15000g

### Extend

3. a. 2kg  
Read word problems carefully and identify the numbers and operations needed. Change the g to kg.  $2000\text{g} = 2\text{kg}$ .
- b. 8km      c. 80mm
4. a. 2000g  
Change the units to be the same.  $3\text{kg} = 3000\text{g}$ . Subtract 1000g from 3000g.  $3000\text{g} - 1000\text{g} = 2000\text{g}$ .
- b. 5 jugs
- c. 100g  
Work out how much flour Max uses.  $30\text{g} \times 30 = 900\text{g}$ . Work out how much flour is left from the 1kg bag. Change the units to be the same and subtract the flour Max uses from the total flour in the bag.  $1\text{kg} = 1000\text{g}$ .  $1000\text{g} - 900\text{g} = 100\text{g}$ .

### Apply

5. a. 5150g (or 5.15kg)  
Convert  $1\frac{1}{2}\text{kg}$  to grams.  $1\frac{1}{2}\text{kg} = 1.5\text{kg} = 1500\text{g}$ . The second parcel weighs 300g more

than this.  $1500\text{g} + 300\text{g} = 1800\text{g}$ . The third parcel weighs 50g more than the second parcel.  $1800\text{g} + 50\text{g} = 1850\text{g}$ . Add the three masses together to find the total mass.  $1500\text{g} + 1800\text{g} + 1850\text{g} = 5150\text{g}$ .

- b. 132cm (or 1.32m)  
Convert 1.25m to cm.  $1.25\text{m} = 125\text{cm}$ .  $125\text{cm} - 118\text{cm} = 7\text{cm}$ . Safa grew 7cm in the first year. Add another 7cm for the second year.  $125\text{cm} + 7\text{cm} = 132\text{cm}$ .
- c. 10 drinks

## Comparing measurements (pages 56–57)

### Practise

1. a. <  
Change the units to be the same.  $3\text{m} = 300\text{cm}$ . 60cm is less than 300cm.  $60\text{cm} < 300\text{cm}$ .
- b. >      c. =      d. >
2. a. 120 seconds,  $\frac{1}{4}$  hour, 30 minutes, 1 hour  
Accept answers in equivalent units. Change the units to be the same.  $\frac{1}{4}$  hour = 15 min. 120 seconds = 2 min. 30 min is already in min. 1 hour = 60 min. Write the measurements in order from smallest to largest.
- b. 3000g, 4kg and 200g,  $4\frac{1}{2}\text{kg}$ , 5kg  
Accept answers in equivalent units.
3. (D)  
Add the mass of each set of parcels and change them all to the same units. A:  $1000\text{g} + 300\text{g} = 1300\text{g}$ . B:  $0.2\text{kg} + 0.5\text{kg} + 0.3\text{kg} = 1\text{kg} = 1000\text{g}$ . C:  $\frac{1}{4}\text{kg} + \frac{1}{2}\text{kg} = \frac{3}{4}\text{kg} = 750\text{g}$ . D:  $1\text{kg} + 500\text{g} = 1\text{kg} + 500\text{g} = 1500\text{g}$ . 1500g is the greatest mass.

### Extend

4. a. <      b. =      c. =      d. =
5. a. 1075p, 1100p, £11.70, £11 and 85p, £12  
b. £3.90, £3 and 95p, £4, £4.05, £4.40
6. a. 22.5m  
Change the units to be the same. 2m and  $25\text{cm} = 225\text{cm}$ .  $225\text{cm}$  stays the same.  $2\frac{25}{100}\text{m} = 225\text{cm}$ .  $22.5\text{m} = 2250\text{cm}$ .  $2250\text{mm} = 225\text{cm}$ . All the measurements are equivalent to 225cm except 22.5m.
- b. 4kg and 50g

## Apply

7. Alice, Emika, Dina, Carla, Beth  
The winner is the child who jumps the farthest, so the highest number goes first. Put the numbers in order from highest to lowest. 1.74m, 140cm, 135cm, 1m 28cm, 1.09m.
8. a. A (or 600ml)  
Use the scale and the number of divisions marked on the scale on each container. On A, the scale shows 1 litre with 5 divisions. 1 litre = 1000ml and  $1000\text{ml} \div 5 = 200\text{ml}$ . Each division is worth 200ml. There are 600ml of water in the container.
- b. E (or 400ml)

## Estimating measurements (pages 58–59)

### Practise

1. a. 3kg (accept  $\pm \frac{1}{4}\text{kg}$ , 0.25kg or 250g)  
The scale shows 0 to 4kg with one unmarked division. The unmarked division must be 2kg. The arrow is pointing half-way between 2kg and 4kg, so it must be indicating 3kg.
- b. 4kg (accept  $\pm \frac{1}{4}\text{kg}$ , 0.25kg or 250g)
- c. 5kg (accept  $\pm \frac{1}{4}\text{kg}$ , 0.25kg or 250g)
2. a. 70 litres (accept  $\pm 5$  litres)  
Use the method used in **Question 1**.
- b. 75 litres (accept  $\pm 10$  litres)
- c. 56 litres (accept  $\pm 3$  litres)
3. a. 10km (accept  $\pm 2\text{km}$ )  
Use the information given in the question. Alton to Byham is 20km. The distance from Byham to Catley is about half the distance.  $20\text{km} \div 2 = 10\text{km}$ .
- b. 40km (accept  $\pm 2\text{km}$ )

### Extend

4. a. Not reasonable   
Make a comparison with other known measures of items. For example: 1.5 litres would be the capacity of a large bottle of lemonade, so a capacity of 1.5 litres for a mug is too great.
- b. Reasonable       c. Reasonable
- d. Not reasonable
5. a. 80cm (accept  $\pm 10\text{cm}$ )  
Use the method used in **Question 1**.

- b. 100g (accept  $\pm 25\text{g}$ )
- c. 400m (accept  $\pm 50\text{m}$ )
- d. 500m (accept  $\pm 50\text{m}$ )

6. a. 9 litres                      b. 14m

## Apply

7. 5 tins  
Read word problems carefully and identify the numbers and operations needed. Multiply the area by 2 to find the area of two coats.  $36\text{m}^2 \times 2 = 72\text{m}^2$ . 4 tins would cover  $15\text{m}^2 \times 4 = 60\text{m}^2$ , which is not enough. 5 tins would cover  $15\text{m}^2 \times 5 = 75\text{m}^2$ , which is too much. It is not possible to buy part tins, so Tania will need to buy 5 tins of paint.
8. 12m  
Multiply the amount of ribbon by 8 to find the amount of ribbon needed for 8 gifts.  $140\text{cm} \times 8 = 1120\text{cm}$ .  $1120\text{cm} = 11.20\text{m}$ . Sofia must buy the ribbon in whole metres. 11m would not be enough, so Sofia should buy 12m of ribbon.

## Measurement problems (pages 60–61)

### Practise

1. a. <  
Change the units to be the same.  $2\text{m } 95\text{cm} = 295\text{cm}$ .  $3\text{m} = 300\text{cm}$ .  $295\text{cm}$  is less than  $300\text{cm}$ .  $295\text{cm} < 3\text{m}$ .
- b. >      c. =      d. >      e. <      f. >
2. a. 850cm  
Change the units to centimetres.  $9\text{m} = 900\text{cm}$ . Subtract the known part from the whole.  $900\text{cm} - 50\text{cm} = 850\text{cm}$ .
- b. 2500ml
- c. 0.1kg (or  $\frac{1}{10}\text{kg}$ )
- d. 100m

### Extend

3. a. 2800ml  
Change the measurements so they have the same unit.  $3\text{ litres} = 3000\text{ml}$ . Subtract the known part from the whole.  $3000\text{ml} - 200\text{ml} = 2800\text{ml}$ .
- b. 2m 10cm
4. a. A = 300g (or 0.3kg)
- b. B = 1000ml (or 1 litre)      C = 2500ml (or 2.5 litres or  $2\frac{1}{2}$  litres)      D = 3000ml (or 3 litres)

## Apply

5. a. 29km

There are two possible shortest routes as other routes are obviously longer. One route is Alton to Catley, then Catley to Dyford.  $18\text{km} + 11\text{km} = 29\text{km}$ . Another route is Alton to Byham, Byham to Catley, then Catley to Dyford.  $10\text{km} + 14\text{km} + 11\text{km} = 35\text{km}$ . The shortest distance is 29km.

b. 35km

There are three possible shortest routes as other routes are obviously longer. One route is Byham to Catley, then Catley to Exbury.  $14\text{km} + 23\text{km} = 37\text{km}$ . Another route is Byham to Finworth, then Finworth to Exbury.  $29\text{km} + 7\text{km} = 36\text{km}$ . Another route is Byham to Catley, Catley to Dyford, then Dyford to Exbury.  $14\text{km} + 11\text{km} + 10\text{km} = 35\text{km}$ . The shortest distance is 35km.

6. a. 120cm = 1m 20cm

Change the units to be the same.  $2\text{m} = 200\text{cm}$ . Subtract  $80\text{cm}$  from  $200\text{cm}$ .  $200\text{cm} - 80\text{cm} = 120\text{cm}$ .  $120\text{cm} = 1\text{m } 20\text{cm}$ .

b. 2600ml = 2 litres 600ml

Change the units to be the same.  $3\text{l} = 3000\text{ml}$ . Subtract  $400\text{ml}$  from  $3000\text{ml}$ .  $3000\text{ml} - 400\text{ml} = 2600\text{ml}$ .  $2600\text{ml} = 2\text{ litres } 600\text{ml}$ .

## Perimeter (pages 62–63)

### Practise

1. a. 16cm

The perimeter is the distance around the outside edge of a 2D shape. Count the number of centimetres on each length and width.  $5\text{cm} + 3\text{cm} + 5\text{cm} + 3\text{cm} = 16\text{cm}$ .

b. 24cm c. 26cm

2. a. 66cm

Add the length and the width.  $21\text{cm} + 12\text{cm} = 33\text{cm}$ . There are two lengths and two widths, so double this total.  $33\text{cm} \times 2 = 66\text{cm}$ .

b. 90cm c. 108cm

### Extend

3. a. 16cm

Use the method used in **Question 2**, but measure the length and width using a ruler showing centimetres.

b. 12cm

4. a. 38cm b. 86cm

c. 12cm

The perimeter (84cm) and the length (30cm) are known. The total of the two lengths is  $30\text{cm} \times 2 = 60\text{cm}$ . The two widths must be the two lengths subtracted from the perimeter. The two widths are  $84\text{cm} - 60\text{cm} = 24\text{cm}$ , so the width is  $24\text{cm} \div 2 = 12\text{cm}$ .

d. 28m e. 8cm f. 300cm (or 3m)

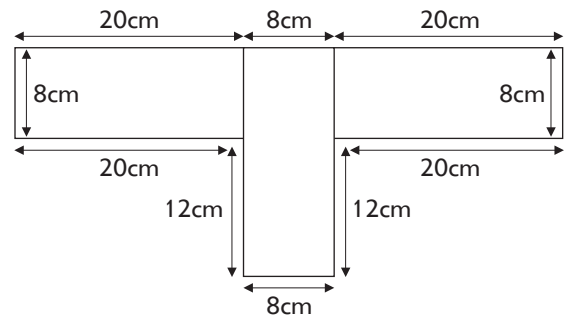
## Apply

5. 11cm and 1cm or 10cm and 2cm or 9cm and 3cm or 8cm and 4cm or 7cm and 5cm or 6cm and 6cm

Accept any three correct answers. If a rectangle has a perimeter of 24cm, the sum of one length and one width must be half of this. One length and one width is  $24\text{cm} \div 2 = 12\text{cm}$ . The length and width are a whole number of units. Find two whole numbers that total 12cm.

6. a. 136cm

One tile is 20cm long and 8cm wide. Three tiles are used to make the shape. Mark the sides of the shape with the measurements given. Subtract the width of the tile from the length of the tile to find the missing lengths.  $20\text{cm} - 8\text{cm} = 12\text{cm}$ .



Add each length.  $20\text{cm} + 8\text{cm} + 20\text{cm} + 8\text{cm} + 20\text{cm} + 12\text{cm} + 8\text{cm} + 12\text{cm} + 20\text{cm} + 8\text{cm} = 136\text{cm}$ .

b. 96cm

Work out the length of the missing side.  $20\text{cm} - 8\text{cm} - 8\text{cm} = 4\text{cm}$ . Add each length.  $20\text{cm} + 8\text{cm} + 20\text{cm} + 8\text{cm} + 4\text{cm} + 20\text{cm} + 8\text{cm} + 8\text{cm} = 96\text{cm}$ .

## Area (pages 64–65)

### Practise

1. a. 12cm<sup>2</sup>

Count the squares in the shape. There are 12 squares, so the area is 12cm<sup>2</sup>.

b. 15cm<sup>2</sup> c. 15cm<sup>2</sup>

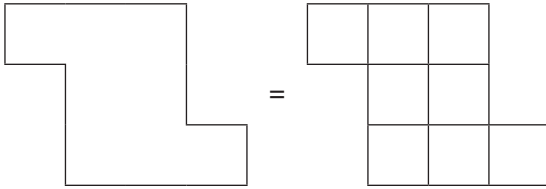
2. a. 15m<sup>2</sup> b. 16m<sup>2</sup> c. 30m<sup>2</sup>

## Extend

3. a.  $24m^2$   
There are  $6m^2$  in the top row. There are 4 rows. The area is  $6m^2 \times 4 \text{ rows} = 24m^2$ .

b.  $24m^2$

4. a.  $8m^2$   
Mark the drawing to identify the squares in the shape.



There are 8 square metres ( $8m^2$ ).

b.  $14m^2$

## Apply

5. a.  $40cm^2$   
Each rectangle has an area of  $8cm^2$ .  $5 \times 8cm^2 = 40cm^2$ .

b.  $56cm^2$

6. a.  $52m^2$   
There are 13 slabs along the length of the pond and 4 rows across the width. Multiply the length by the width to find the area of the pond and path.  $13m^2 \times 4 = 52m^2$ .

- b.  $22m^2$   
Count the  $m^2$  (the slabs) around the edge of the pond. There are  $30m^2$ . Subtract the area of the path from the area of the path and pond.  $52m^2 - 30m^2 = 22m^2$ .

## 2D shapes (pages 66–67)

### Practise

- a. **square**  
The sides are equal and parallel. Each angle is  $90^\circ$ .

b. **rectangle** (or **oblong**)  
The opposite sides are equal and parallel. Each angle is  $90^\circ$ .

c. **parallelogram**  
It has two pairs of parallel sides. The opposite angles are equal.

d. **kite**  
It has two pairs of adjacent and equal sides. There is one pair of equal angles. The diagonals cross at right angles.

- rhombus**  
The sides are equal. It has two pairs of parallel sides. There are two pairs of equal angles. The diagonals cross at right angles.
- trapezium**  
It has one pair of parallel sides.

- a. **equilateral triangle**  
Identify the properties of triangles. If the sides are equal, think about equal angles and the types of angles.

b. **right-angled isosceles triangle**

c. **scalene triangle**

## Extend

	Shapes with right angles	Shapes with no right angles
Shapes with 2 equal sides		
Shapes with more than 2 equal sides		

Accept any shapes that match the criteria. Use the criteria given in the columns and rows to draw a shape that has both properties.

- a.

b.

Accept any shapes that match the criteria.

## Apply

- Column headers: **Not quadrilaterals** and **Quadrilaterals**

Row headers: **Equal angles** and **Angles not equal** or **Opposite sides are equal** and **Opposite sides are not equal**

Accept any titles for columns and rows that match the shapes. Think about what properties the two shapes in any section have that makes them both different to the other shapes in the column or row. Note that regular shapes is not a correct way of sorting the shapes as a rectangle is not a regular quadrilateral.

6. **Yes** Because rectangles have four right angles and the opposite sides are equal (and parallel), and so do squares.

Accept any answers that explain that squares have the properties of rectangles.

## 3D shapes (pages 68–69)

### Practise

1. a. 6 12 8  
A face is a side of a 3D shape. An edge is where two faces meet. It appears as a line on drawings of shapes. A vertex is where two or more edges meet. It is a corner of the 3D shape. The plural of vertex is vertices.
- b. 5 9 6
- c. 5 8 5
- d. 7 15 10
2. a. **True**
- b. **True**
- c. **False**
3. a. **circle**  
Think about the 2D shapes that can be seen on the 3D shapes.
- b. **triangle**

### Extend

4. a. Both shapes have triangular (or rectangular) faces. or They both have five faces.  
Accept any other correct common property.
- b. One shape is a prism and the other is a pyramid. or One has 5 vertices and the other has 6. or One has 9 edges and the other has 8.  
Accept any other correct difference.

5. **cuboid** **triangular prism**  
**pentagonal prism**  
**square-based pyramid**

### Apply

6. a. **8 faces**  
A face is a side of a 3D shape.
- b. **Yes** Because the two end faces are the same.  
Accept any explanation that shows there are two end faces that are the same (and that the other faces are rectangular) and/or the shape has a similar cross-section. A cross-section

is a cut parallel to the end faces. No matter where the prism is cut, if the cut is parallel to the end face, the cross-section will have the same shape.

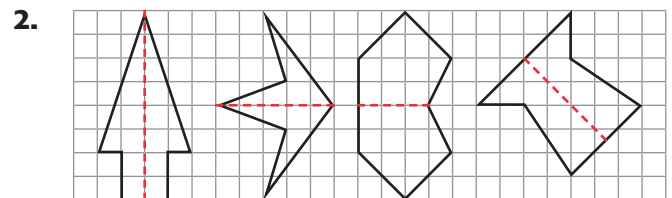
7. a. **Never**   
Think about the 2D shapes that can be seen on the shapes.
- b. **Sometimes**
- c. **Always**

## Symmetry (pages 70–71)

### Practise

1. **B**   
**D**

If a shape is reflected, then the whole shape is flipped over a line of symmetry or mirror line and appears as a reflection. Check each point to see if the shape has been reflected in the mirror line.



### Extend

4. a.
- b.
- c.
- d.

5. a. 0  
It may be useful to sketch the shape and draw any lines of symmetry on to it.
- b. 3

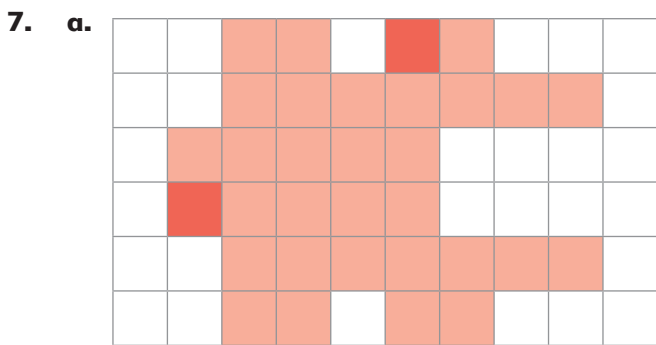
### Apply



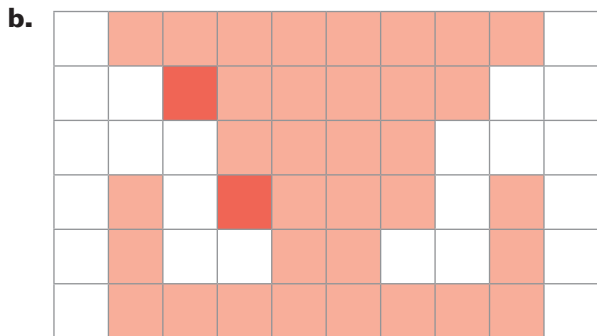
Accept any trapezium without a line of symmetry.



Accept any trapezium with a line of symmetry.



Find possible lines of symmetry – vertical, horizontal or diagonal – and check to see if by adding two squares, the shape could have a line of symmetry. This shape has a horizontal line of symmetry when the two squares are shaded.



## Angles (pages 72–73)

### Practise

1.

Acute angles	Right angles	Obtuse angles
B F	A D	C E

An acute angle is an angle less than  $90^\circ$  or one right angle. A right angle is a quarter turn and is  $90^\circ$ . An obtuse angle is an angle larger than  $90^\circ$ , but less than  $180^\circ$ , which is a half turn.

2. a. acute angles: 2, right angles: 0, obtuse angles: 2  
 b. acute angles: 1, right angles: 1, obtuse angles: 2  
 c. acute angles: 2, right angles: 0, obtuse angles: 2

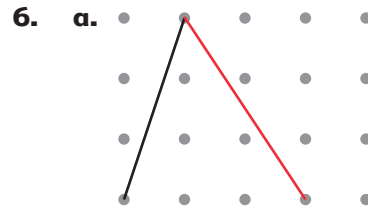
### Extend

3. C, E, A, B, D  
 Think of the two lines of an angle as directions and turning from one direction to the other. The larger the turn, the greater the size of the angle.

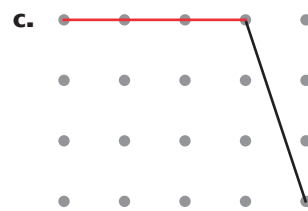
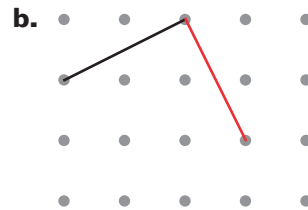
4. a. <      b. =      c. >  
 d. >      e. >      f. <

### Apply

5. a. east (accept E)  
 b. north-east (accept NE)



Accept any line that forms an acute angle.



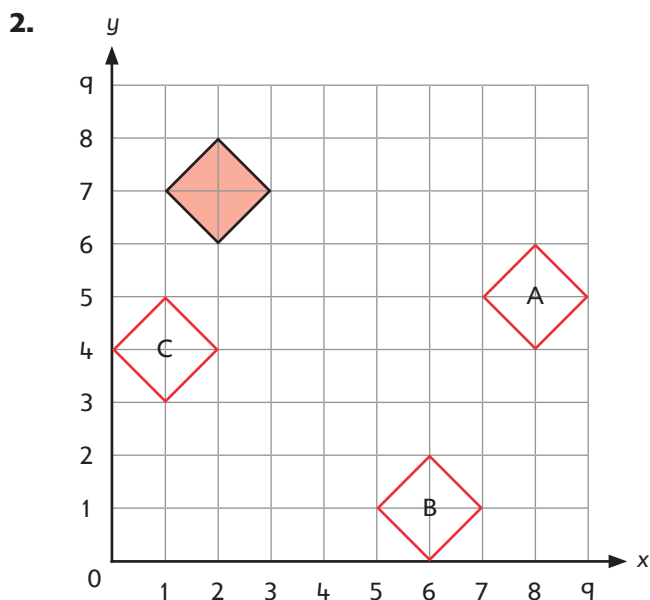
Accept any line that forms an obtuse angle.

## Translation (pages 74–75)

### Practise

1. a. 5 left 1 down  
A translation is a 'slide'. The movement can be horizontal to the left or right and/or vertically up or down. It is usually measured in the squares of a grid. The shape does not change shape or orientation. Choose a corner of the shape in the initial position. Count squares left/right and up/down until you reach the same corner in the new position.
- b. 5 right 1 up      c. 5 left 1 up  
d. 1 right 6 up      e. 1 right 4 up  
f. 6 left 5 down

### Extend



### Apply

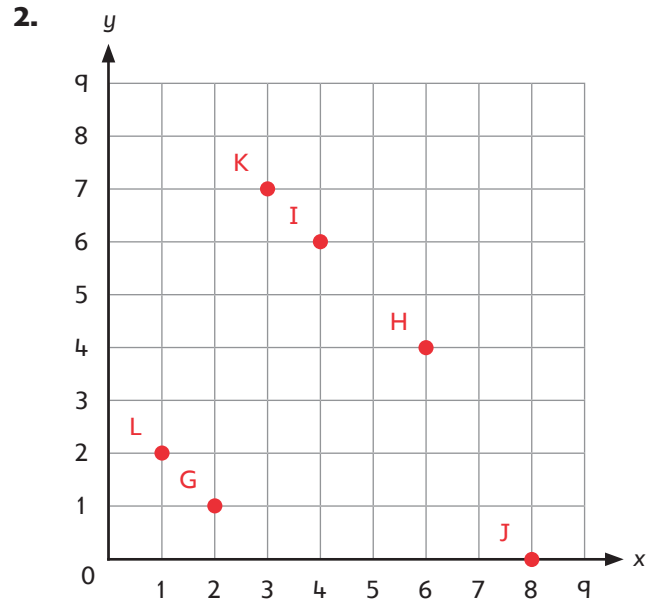
3. a. 6 squares left and 5 squares up  
b. 2 squares left and 4 squares down
4. a. 7 squares right and 4 squares down  
b. 4 squares left and 2 squares up

## Coordinates (pages 76–77)

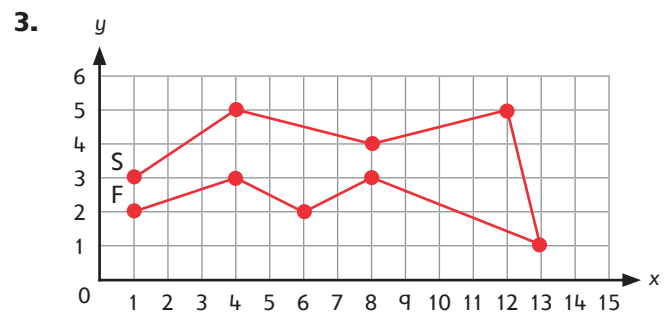
### Practise

1. a. (2, 8)  
The coordinates are written in brackets using the number from the x-axis (the horizontal axis) and the number from the y-axis (the vertical axis) separated by a comma. The number from the x-axis is always given first. Read down from the point: 2. Read across from the point: 8. The coordinates are (2, 8).

- b. (6, 7)    c. (7, 6)    d. (0, 4)  
e. (4, 3)    f. (8, 2)

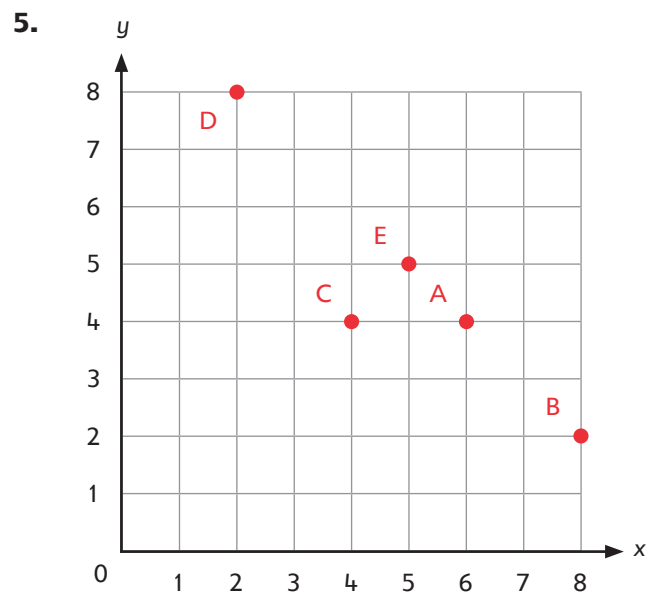


### Extend



4. a. (5, 9)    b. (6, 8)    c. (5, 7)    d. (4, 8)

### Apply



The coordinates are B (8, 2), C (4, 4), D (2, 8) and E (5, 5).

## Coordinates and shape (pages 78–79)

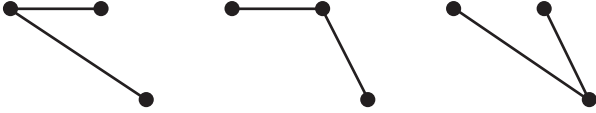
### Practise

1. a. (6, 1)  
Join the dots to form two sides of a square. Squares have right angles and the way the dots are joined must form right angles. The coordinates are written in brackets using the number from the  $x$ -axis (the horizontal axis) and the number from the  $y$ -axis (the vertical axis) separated by a comma. The number from the  $x$ -axis is always given first. Read down from the point: 6. Read across from the point: 1. The coordinates are (6, 1).
- b. (8, 3)
2. a. (1, 1)  
b. (5, 6)  
The point must go at (5, 6) to make a rectangle because it is the only place where the shape will have four right angles. Note that the point cannot go at (7, 4) because the shape will not have right angles.

### Extend

3. a. (2, and any  $y$ -coordinate except 5) or (6, and any  $y$ -coordinate except 5) or (4, 3) or (4, 7)  
Accept any three correct answers. Join the two dots and think where the third vertex could be drawn to make a right-angled triangle.
- b. (0, 5) or (0, 1) or (8, 5) or (8, 1) or (any  $x$ -coordinate except 4, 3)  
Accept any three correct answers.

### Apply

4. a. (3, 3)    b. (7, 3)    c. (1, 7)  
Accept answers in any order. Join the dots to make two sides of the parallelogram. There are three different ways that this can be done.
- 
- Use these two sides to work out where the fourth vertex and the other two sides must be.
5. (11, 13) or any other point on this line except (5, 7), (7, 9) and (9, 11).  
Accept any answer where the  $y$ -coordinate is two greater than the  $x$ -coordinate. Use the pattern in the coordinates to work out what the next coordinate would be. The  $x$ -coordinate is two more each time, so add two to the last

coordinate. The  $y$ -coordinate increases by two each time, so add two to the last coordinate. A coordinate on the line will be (11, 13).

6. (9, 13)  
All the coordinates in a square share one  $x$ -coordinate and one  $y$ -coordinate with another point. Look at the coordinates and note which numbers only appear once. With the  $x$ -coordinates, 9 only appears once. With the  $y$ -coordinates, 13 only appears once. The missing coordinates must be (9, 13). It may help to draw a square and label the corners.

## Bar charts (pages 80–81)

### Practise

1. a. i. 22 children  
Read from the top of the bar labelled Tuesday, across to the  $y$ -axis (the vertical axis). Count the unmarked divisions between the marked divisions on the scale. There are four unmarked divisions between 20 and 25, so each division has a value of 1 child. The bar for Tuesday is at the second division above 20. 22 children had a school lunch on Tuesday.
- ii. 32 children
- b. 3 days  
Find 20 on the vertical axis. Read along the line and count the number of bars that are above the line for 20.
- c. 13 children  
Find the number of children who had a school lunch on Thursday: 25. Find the number of children who had a school lunch on Wednesday: 12. Find the difference between the two numbers.  $25 - 12 = 13$ .
- d. 17 children
- e. 106 school lunches  
Add the number of school lunches for each day.  $15 + 22 + 12 + 25 + 32 = 106$ .

### Extend

2. a. 6 children (accept  $\pm 1$  child)  
Use the known values to estimate the number of children who had pizza and salads. Estimate by looking at the numbered values. They are increasing by 5, so estimate the division as fifths. Each fifth will represent 1 meal. Find the number of children who had pizza. The bar is just over 10, so estimate 11. Find the number of children who had salad. The bar is exactly



on 5, so estimate 5. Find the difference between the two numbers.  $11 - 5 = 6$ .

- b. 3 children (accept  $\pm 1$  child)
- c. 53 children (accept  $\pm 2$  children)

### Apply

3. a. 19 children  
From the chart in **Question 1**, 32 children had a school lunch on Friday.  $32 - 13 = 19$ .
- b. Because half-way between 5 and 10 children would be  $7\frac{1}{2}$  children and you can't have  $\frac{1}{2}$  a child.  
Accept any reasonable explanation.
- c. Because some children might not be ordering/eating school lunches or Because some children might be ill/off school.  
Accept any reasonable explanation for why the information in either bar chart is limited.
- d. 78 meals (accept  $\pm 2$  meals)  
From the chart in **Question 2**, there are 53 meals in total. There are 5 choices. 5 extra of each option is a total of  $5 \times 5 = 25$  extra meals.  $53 + 25 = 78$ .

## Time graphs (pages 82–83)

### Practise

1. a.  $18^\circ\text{C}$   
Find 8:30 a.m. on the x-axis. Follow the line vertically until you reach the line of the graph. Move horizontally to the y-axis and read the temperature shown.
- b.  $23^\circ\text{C}$
- c. 9:30 a.m.  
Find  $22^\circ\text{C}$  on the y-axis. Follow the line horizontally until you reach the line of the graph. Move vertically to the x-axis and read the time shown.
- d. 9:10 a.m. (accept  $\pm 2$  min)  
The only values that are known for certain are the values that are recorded. The lines connecting these values give an estimate (a trend) of values in between. Find  $20^\circ\text{C}$  on the y-axis. Follow the line horizontally until you reach the line of the graph. Move vertically to the x-axis. The time is approximately  $\frac{1}{3}$  of the way between 9:00 a.m. and 9:30 a.m. Estimate the time as 9:10 a.m.
- e. Accept any temperature between  $20^\circ\text{C}$  and  $21^\circ\text{C}$ .
- f. The temperature stays the same.

### Extend

2. a. 30km  
b. 55 min (accept  $\pm 5$  min)  
c. 2 hr 30 min

### Apply

3. a. The heating was switched off. or The windows were opened. or The doors were left open after break. or The children went out for break.  
Accept any reasonable explanation.
- b.  $5^\circ\text{C}$   
Find the temperatures for 8:30 a.m. and 10:30 a.m. Find the difference between the two temperatures.  $23^\circ\text{C} - 18^\circ\text{C} = 5^\circ\text{C}$ .
- c. Rosie stopped for a rest. or Rosie stopped for something to eat. or Rosie met some friends.  
Accept any reasonable explanation.
- d. 15 min  
The first 5km took 15 mins (from 1:00 p.m. to 1:15 p.m.). The last 5km took 30 min (from 3:30 p.m. to 4:00 p.m.).  $30 \text{ min} - 15 \text{ min} = 15 \text{ min}$ .

## Pictograms (pages 84–85)

### Practise

1. a. blue, green, yellow, red, orange  
Each full star represents 5 points. Order the teams from largest to smallest depending on the number of stars they have.
- b. 15  
Each star represents 5 points. The orange team's score is shown by 3 stars.  $3 \times 5 = 15$ .
- c. 30      d. 10
- e. blue, yellow, red, orange, green  
Reorder the teams with the new scores. It may help to cross out the stars on the pictogram and draw new stars to show how the points have changed.

### Extend

2. a. i. £110  
Zak has 5 full squares and 1 half square. Each full square represents £20. The half square represents half of £20, which is £10.  $\pounds 20 \times 5 + \pounds 10 = \pounds 110$ .
- ii. £125  
Kai has  $6\frac{1}{4}$  squares. This represents  $\pounds 20 \times 6\frac{1}{4} = (\pounds 20 \times 6) + (\pounds 20 \times \frac{1}{4}) = \pounds 120 + \pounds 5 = \pounds 125$ .

- iii. £155  
Sally has  $7\frac{3}{4}$  squares. This represents £20  
 $\times 7\frac{3}{4} = (£20 \times 7) + (£20 \times \frac{3}{4}) = £140$   
 $+ £15 = £155.$

- b. £80      c. £105

## Apply

3. a.  $8\frac{1}{2}$

Every £20 raised is 1 square. If £170 is raised, then divide 170 by 20.  $170 \div 20 = 8r.10$ . A remainder of 10 out of 20 is  $\frac{1}{2}$  of a square. Altogether, this will be  $8\frac{1}{2}$  squares.

- b.  $11\frac{1}{2}$   
c. A pictogram is useful because it is easy to compare amounts.  
Accept any reasonable reason.  
d. A pictogram is not useful because it is difficult to show exact amounts. For example, it would be difficult to show £87.35 using the pictogram in Question 2.  
Accept any reasonable reason.

## Tables (pages 86–87)

### Practise

Choice	Tally	Total
Disco		28
Cinema		16
Beach visit		22
Sports afternoon		20

A tally is used to help record counting. Each count of 1 is shown by a line. There are 4 vertical lines and a fifth diagonal line across the 4 vertical lines to make a group of 5. Count in fives and add any extra vertical lines as extra ones. For Disco, there are 5 groups of 5 and 3 extra lines.  $5 \times 5 + 3 = 28$ . For Cinema,  $16 \div 5 = 3r.1$ , which is 3 groups of 5 tallies and 1 extra line.

2. a. 5 games  
Read the column titles (Won and Drawn) and row titles (Oak School and Woodvale School) to find the information. Oak School won 9 games and drew 1 game.  $9 + 1 = 10$ . Woodvale School won 3 games and drew 2 games.  $3 + 2 = 5$ . Find the difference between the totals for the two schools.  $10 - 5 = 5$ .  
b. 4 games

- c. Oak School: 28 points, High Road School: 21 points, Seaview School: 16 points, Woodvale School: 11 points

Multiply the points in the Won column by 3. Add on the number of points for a draw. Do not use the 'Lost' column as it does not earn any points. For example: Oak School won 9 games:  $9 \times 3 = 27$ . Oak School drew 1 game:  $1 \times 1 = 1$ .  $27 + 1 = 28$ .

## Extend

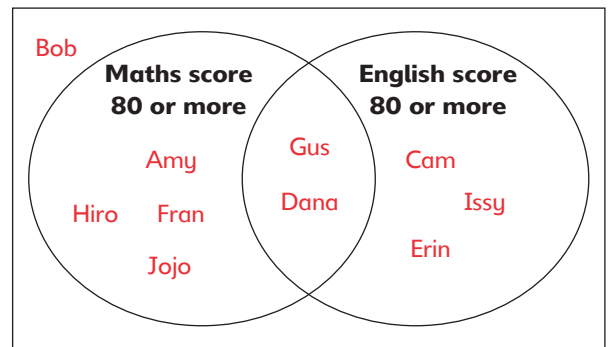
3.

	60 and over years old	40 to 59 years old	18 to 39 years old	Under 18 years old	Total
Friday evening	127	786	1128	97	2138
Saturday afternoon	328	618	485	297	1728
Saturday evening	85	862	1209	138	2294
Total	540	2266	2822	532	6160

Find a missing value in any column or row where there is only one missing number. For example: to find the number of 40- to 59-year-olds who visited on Saturday afternoon, add the two known numbers in this column and subtract from the total.  $786 + 862 = 1648$ .  $2266 - 1648 = 618$ .

## Apply

4.



Children who scored 80 or more in maths are in the oval for a maths score of 80 or more. Children who scored 80 or more in English are in the oval for an English score of 80 or more. Only children who scored 80 or more in both tests are in the section where the two ovals overlap. If a child has scored less than 80 in both maths and English, their name is written inside the rectangle but not in any of the sets.

## Final practice (pages 88–92)

1. a. 40 56 72

Find the difference between 32 and 48. This is

two steps in the sequence, so divide it by two.  
 $48 - 32 = 16$ .  $16 \div 2 = 8$ . Check that this is the same for each step. This is a +8 sequence. Find the missing numbers in the sequence by adding 8.  $32 + 8 = 40$ .  $48 + 8 = 56$ .  $64 + 8 = 72$ . Award 1 mark for three correct answers.

- b. 175 200 250 275

Use the method used in **Question 1a**. Award 1 mark for four correct answers.

- c. 5000 6000 7000 10000

Use the method used in **Question 1a**. Award 1 mark for four correct answers.

2. a. XX XXI XXII

Change the Roman numerals into digits. The sequence is: 18, 19, 20, 21, 22, 23. Write the missing numbers in Roman numerals.  $20 = XX$ ,  $21 = XXI$ ,  $22 = XXII$ . Award 1 mark for three correct answers.

- b. XXXVII XXXIX XL

Use the method used in **Question 2a**. The Roman numerals are 38 and 41. The missing numbers must be 37, 39 and 40. Award 1 mark for three correct answers.

- c. XLV LXXV XCV

Use the method used in **Question 2a**. The Roman numerals are 55, 65 and 85. The missing numbers must be 45, 75 and 95. Award 1 mark for three correct answers.

3. a. 6900

When counting in hundreds, 6892 is between 6800 and 6900. Because the tens digit is 9, 6892 should be rounded up to 6900. Award 1 mark for the correct answer.

- b. 4000

When counting in thousands, 4087 is between 4000 and 5000. Because the hundreds digit is 0, 4087 should be rounded down to 4000. Award 1 mark for the correct answer.

- c. 9901 10400 9542

Use the method used in **Question 3b**. Award 1 mark for three correct answers.

4. a. 8080

Set the calculation out as a column addition.

$$\begin{array}{r} 2095 \\ + 5985 \\ \hline 8080 \\ \hline 111 \end{array}$$

Award 1 mark for the correct answer.

- b. 4575

Set the calculation out as a column subtraction.

$$\begin{array}{r} 61215 \\ 73610 \\ - 2785 \\ \hline 4575 \end{array}$$

Award 1 mark for the correct answer.

5. a.  $5047 + 2653 = 7700$

Work through the calculation as though adding two four-digit numbers. Remember to add any exchanged digits. Add the ones and exchange ten ones for one ten. Add the tens and the exchanged ten. To get a zero, the missing number needs to be 5. Exchange ten tens for one hundred. Add the hundreds. To get a seven, the missing number needs to be 0. Award 1 mark for one missing digit. Award 2 marks for two missing digits. Maximum 2 marks.

- b.  $7053 - 2728 = 4325$

Award 1 mark for one missing digit. Award 2 marks for two missing digits. Maximum 2 marks.

6. a. 450 fish fingers

Read word problems carefully and identify the numbers and operations needed.  $75 \text{ fish fingers} \times 8 \text{ bags} = 600 \text{ fish fingers in total}$ .  $50 \text{ meals} \times 3 \text{ fish fingers} = 150 \text{ fish fingers needed for the meal}$ .  $600 \text{ fish fingers} - 150 \text{ fish fingers} = 450 \text{ fish fingers left for the freezer}$ . Award 1 mark for a correct method that would lead to the correct answer. Award 2 marks for the correct answer. Maximum 2 marks.

- b. This is never true

This is a trial question. Try some examples to test the idea. Think about the trials. When multiplying an even number by an odd number, the answer will always be even. Every multiple of an even number is an even number. Adding another even number for the next multiple will give another even number. Award 1 mark for the correct answer.

7. a. 0.17

Use the place value chart titles and record  $\frac{17}{100}$ . This is  $\frac{7}{100}$  and  $\frac{10}{100}$ , which is  $\frac{1}{10}$ . Write these fractions in the correct place value columns.

O	.	t	h
0	.	1	7

Award 1 mark for the correct answer.

b. **0.3**

Use the method used in **Question 7a**.  
Award 1 mark for the correct answer.

8. a.  $\frac{9}{10}$

Write 0.9 in the correct place value columns.

O	.	t	h
0	.	9	

Reading the place value chart titles shows 9 tenths (t). This is  $\frac{9}{10}$ . Award 1 mark for the correct answer.

b.  $\frac{7}{100}$

Use the method used in **Question 8a**.  
Remember to put a 0 in the tenths column.  
Award 1 mark for the correct answer.

9. a.  $6.07 \times 10 = 60.7$

Using the number cards, the answer must be 60.7. Multiplying by 10 has moved the digits one place to the left, so the number must have the digits moved in the opposite direction (to the right) by one place. This gives 6.07. Award 1 mark for two correct answers.

b.  $6070 \div 100 = 60.7$

Using the number cards, the answer must be 60.7. Dividing by 100 has moved the digits two places to the right, so the number must have the digits moved in the opposite direction (to the left) by two places. This gives 6070. Award 1 mark for two correct answers.

10. a. **Dave** (accept **12.75 sec**)

In running races, the person with the lowest time wins the race. Identify the lowest decimal number from the 80m row. The lowest whole numbers have 12 sec. Of 12.9 sec and 12.75 sec, 12.75 sec is the lower number as it has 7 tenths. Award 1 mark for the correct answer.

b. **Bivan** (accept **2.3m**)

In jumping events, the person with the longest distance will win the event. Four of the children jumped over 2m. The furthest jumps are the two distances with 3 tenths (2.36m and 2.3m). Of these, 2.36m is the furthest as it has 6 hundredths, whereas 2.3m has 0 hundredths. Abi with 2.36m would jump the furthest and Bivan with 2.3m would be second. Award 1 mark for the correct answer.

c. **Bivan** (accept **13.4 sec**)

Use the method used in **Question 10a**.

The next highest number after 13 is 13.4.

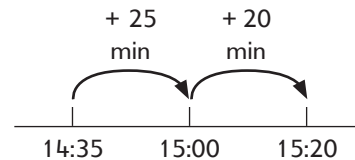
Award 1 mark for the correct answer.

d. **Abi** (accept **2.36m**)

Use the method used in **Question 10b**.  
The only number greater than 2.3 is 2.36.  
Award 1 mark for the correct answer.

11. a. **45 min**

Change the time on the clock (25 minutes to 3) to 24-hour time: 14:35. Find the difference between 14:35 and 15:20 by counting up.



Add the two steps. 25 min + 20 min = 45 min. Award 1 mark for the correct answer.

b. **24 min**

Use the method used in **Question 11a**.  
11:44 a.m. + 16 min = 12:00 p.m. 12:00 p.m. + 8 min = 12:08 p.m. 16 min + 8 min = 24 min. Award 1 mark for the correct answer.

12. a. **250cm**

Change 10m into centimetres.  $10\text{m} \times 100 = 1000\text{cm}$ . Divide the length of rope by 4.  $1000\text{cm} \div 4 = 250\text{cm}$ . Award 1 mark for a correct conversion of units. Award 2 marks for the correct answer. Maximum 2 marks.

b. **20 mugs**

There are 4 lots of 250ml in 1l. To find 5l, multiply this by 5. 5 lots of 4 = 20 mugs. Award 1 mark for a correct conversion of units. Award 2 marks for the correct answer. Maximum 2 marks.

13. a. **30m<sup>2</sup>**

There are 6 squares in a row and 5 rows.  $6 \times 5 = 30$ . Each square represents  $1\text{m}^2$ , so the area is  $30\text{m}^2$ . Award 1 mark for the correct identification of the length (6m) and width (5m) of the rectangle. Award 2 marks for the correct answer. Maximum 2 marks.

b. **28m<sup>2</sup>**

Award 1 mark for the correct identification of the length (7m) and width (4m) of the rectangle. Award 2 marks for the correct answer. Maximum 2 marks.

14. **5750 metres**

The units in the addition must be the same. Change 4.5km into metres.  $4.5\text{km} \times 1000 = 4500\text{m}$ .  $4500\text{m} + 1250\text{m} = 5750\text{m}$ . Award 1 mark for a correct conversion of units. Award 2

marks for the correct answer. Maximum 2 marks.

15.  $-4^{\circ}\text{C}$

Use a number line to help if needed.  $-3 + 14 = 11$ .  $11 - 15 = -4$ . Award 1 mark for a correct method that would lead to the correct answer. Award 2 marks for the correct answer. Maximum 2 marks.

16. a.  $\frac{3}{10}$

Dividing 1 by 10 is  $\frac{1}{10}$ . Dividing 3 by 10 is  $\frac{3}{10}$ . Award 1 mark for the correct answer.

b.  $\frac{7}{100}$

$\frac{1}{100}$  is ten times smaller than  $\frac{1}{10}$ . Dividing  $\frac{7}{10}$  by 10 will be  $\frac{7}{100}$ . Award 1 mark for the correct answer.

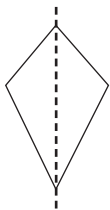
17. a.  $\frac{5}{8}$

To find the missing fraction, subtract  $\frac{3}{8}$  from  $\frac{8}{8}$ .  $\frac{8}{8} - \frac{3}{8} = \frac{5}{8}$ . Award 1 mark for the correct answer.

b.  $\frac{7}{12}$

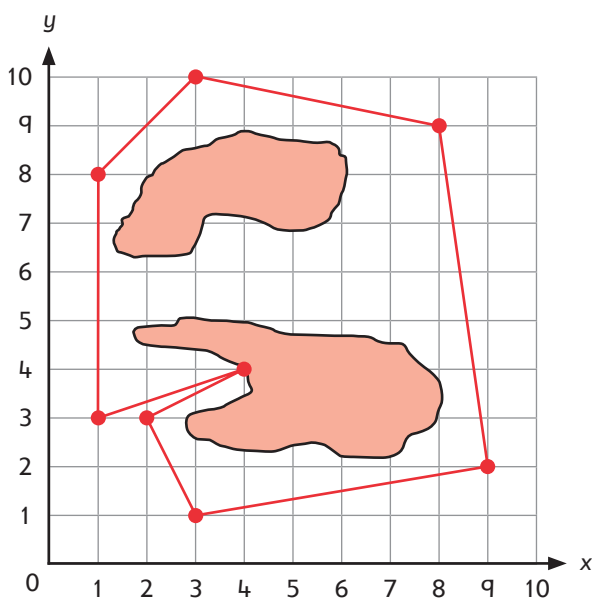
Use the inverse operation.  $\frac{10}{12} - \frac{3}{12} = \frac{7}{12}$ . Award 1 mark for the correct answer.

18. 1



Award 1 mark for the correct answer.

19.



Award 1 mark for 4 or 5 correctly plotted points. The points do not have to be connected. Award

2 marks for 6 or 7 correctly plotted points. The points do not have to be connected. Award 3 marks for 8 correctly plotted coordinates. The points do not have to be connected. Maximum 3 marks.

20. a. 30 pages

On this bar chart, the bars are horizontal. The x-axis (the horizontal axis) shows both the numbers of pages read (read from 0 to the left and shown by the light shaded bars) and the calculations completed (read from 0 to the right and shown by the dark shaded bars). The y-axis (the vertical axis) shows the days of the week. Find the row for Friday and use the light shaded bar for the pages read. This goes to 30. Award 1 mark for the correct answer.

b. 20 pages

Compare the two bars. He read 40 pages on Sunday and 20 pages on Monday.  $40 - 20 = 20$ . Award 1 mark for the correct identification of the value of the bars. Award 2 marks for the correct answer. Maximum 2 marks.

c. 20 calculations

Add the calculations completed for the other days of the week and subtract them from the total.  $10 + 20 + 30 + 10 + 20 + 40 = 130$ .  $150 - 130 = 20$ . Award 1 mark for a correct method that would lead to the correct answer. Award 2 marks for the correct answer. Maximum 2 marks.