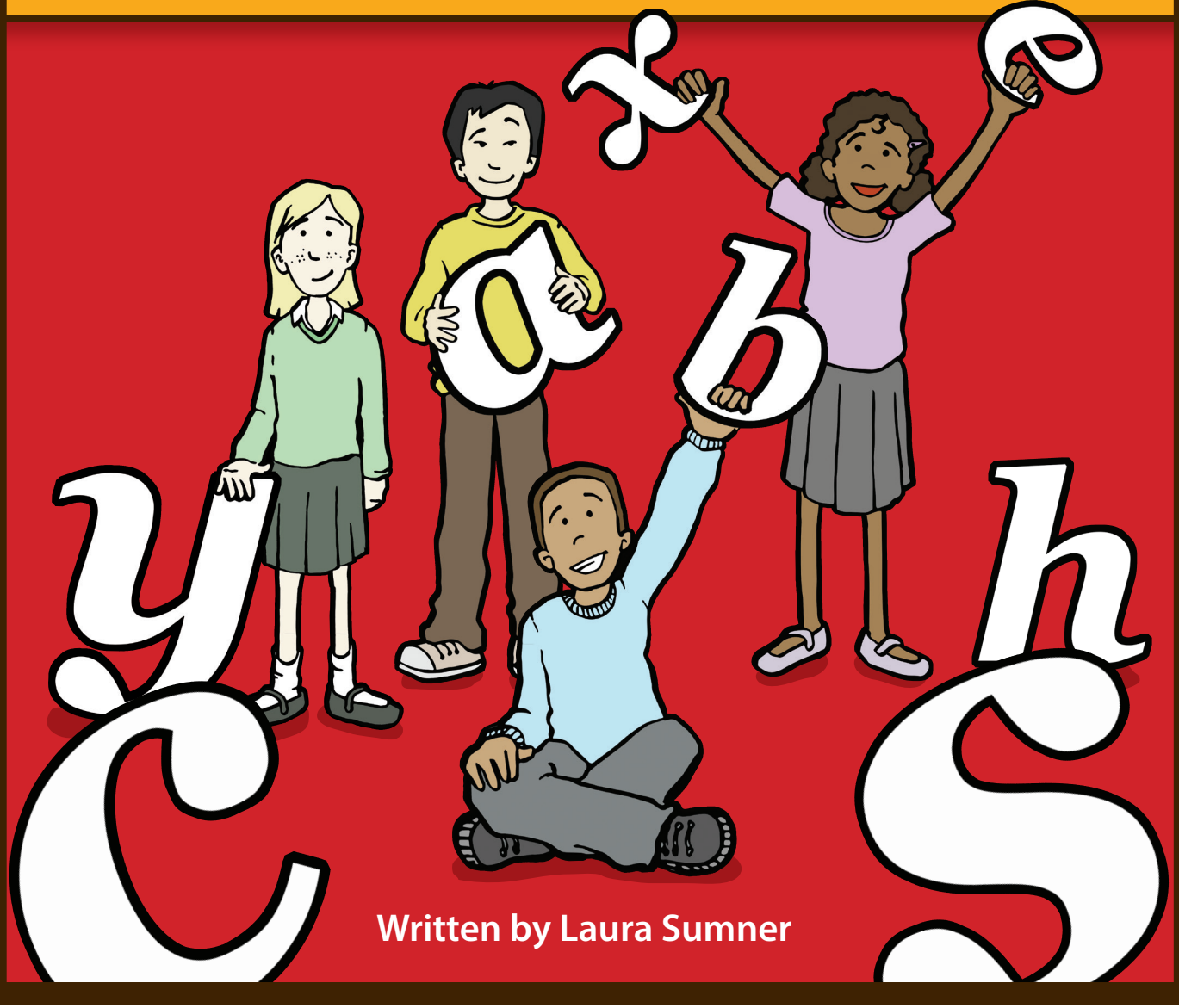
HeadStart
primary

THE ALGEBRA BOOK



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HeadStart primary

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HeadStart Primary: THE ALGEBRA BOOK
Introduction

Rationale and book organisation

These questions have been written in line with the objectives from the Mathematics Curriculum.

Algebra is not included as a separate content domain until the Year 6 Programme of Study, when children are expected to use letters to represent unknown numbers. However, the concepts which children need to grasp in order to gain a full understanding of algebraic principles are developed within the mathematics curriculum from Year 1.

Part 1 (page 1 - 36) of this book is based on pre-Year 6 expectations and provides teachers with the opportunity to revise those concepts at an appropriate level for Year 6 pupils. Therefore, it is expected that teachers will use the first part of the book, as necessary, for the whole class or groups of children. It may be that teachers decide to give the earlier pages as homework, prior to beginning the Algebra topic. Alternatively, Part 1 can be used in earlier year groups in preparation for Year 6, as appropriate.

Part 2 is based on the Year 6 expectations and includes questions to reflect all the Year 6 objectives from the Mathematics Curriculum Algebra content domain. In addition, 'using the correct order of operations' (taken from the Year 6 Number – addition, subtraction, multiplication and division domain) and 'solving equations with an unknown number on both sides' (challenge beyond that expected within the Year 6 curriculum) is applied to algebra.

Approaches to teaching algebra

In order to support the teaching of algebraic concepts, reminders of appropriate strategies, which model important principles in algebra, are identified on some pages. It is understood that schools may vary their teaching approach from the model shown. In such cases, teachers should substitute the appropriate school model.

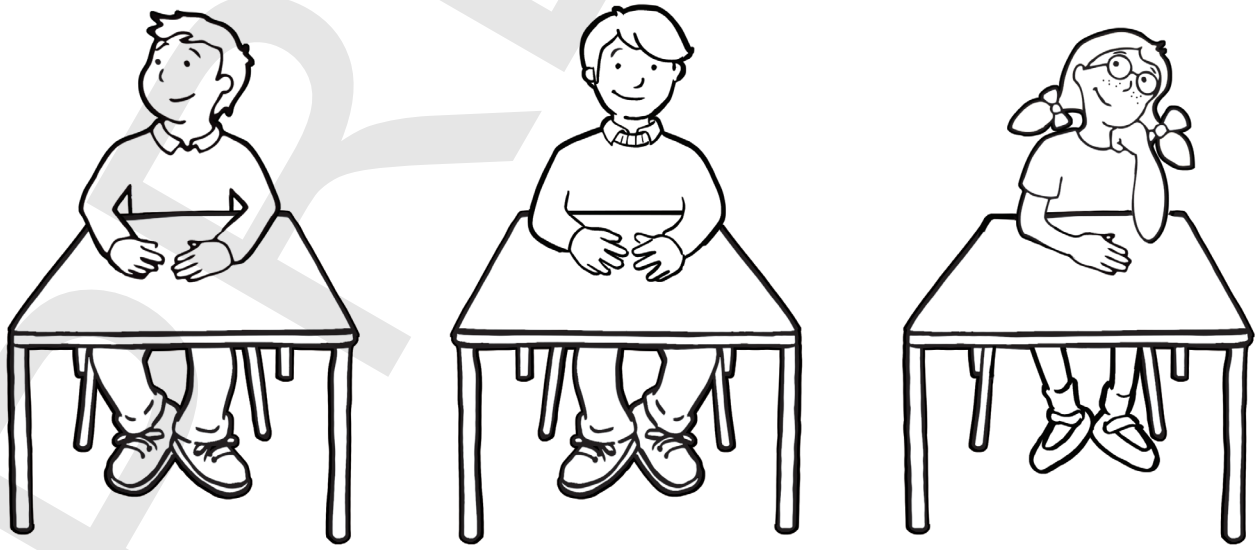
When multiplying in algebra, common practice is to omit the multiplication symbol. However, so that children can focus on the concept of letters representing missing numbers, the early pages within the Year 6 Expectations do include the symbol. Later pages introduce the practice of omitting the multiplication symbol.

Differentiation

In general, the questions are arranged so that they become progressively more difficult on each page. Additionally, for each objective, there is a page or pages which give the opportunity to practise the objective at a standard level (relatively simple calculations e.g. smaller numbers, limited crossing of the tens boundary etc.), as well as a parallel page or pages at a more challenging level (more complex calculations, larger numbers etc.). This is indicated by (ch) at the bottom right hand corner of the page. Consequently, to aid differentiation, those children who need to focus purely on the algebraic concepts are able to work on relatively simple calculation aspects, whilst those children who are capable of understanding algebra with more challenging calculations are also provided for. It may be appropriate for some children to attempt the simpler pages before moving on to the challenging pages. The last objective 'Solve equations with an unknown number on both sides', only contains challenging pages as the concept covers challenge beyond that expected within the Year 6 curriculum.

Using the worksheets

The book is designed so that children are able to write answers on the photocopied sheets, which may be particularly useful if given as homework. However, should it be more appropriate, pupils can easily transcribe the work into exercise books. Where substantial 'working out' needs to be completed, this may have to be carried out in exercise books or on separate paper.



CONTENTS Pre-Year 6 Expectations

Part 1: Pre-Year 6 Expectations

CONTENTS Year 6 Expectations

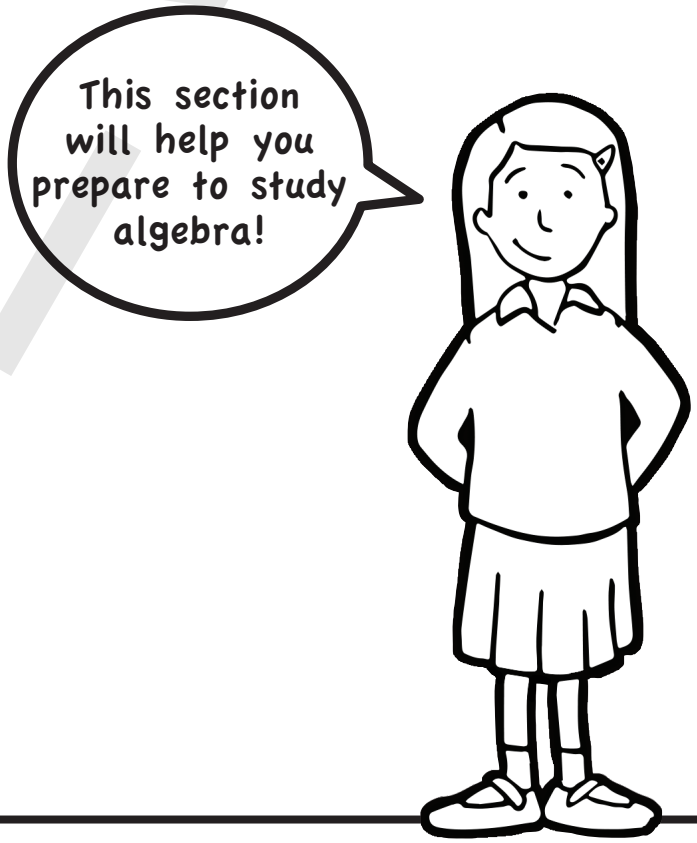
Part 2: Year 6 (and beyond) Expectations

CONTENTS Year 6 Expectations

Part 2: Year 6 (and beyond) Expectations (continued)

Part 1

Pre-Year 6 Expectations



Name ..... Class ..... Date .....

Use the relationship between addition and subtraction to solve missing number problems.

1 Complete the following.

a ☐ + 4 = 9

b 6 + ☐ = 13

c 26 + ☐ = 87

d ☐ + 33 = 76

e 146 + ☐ = 259

f ☐ + 222 = 334

2 Now try these.

a 15 − ☐ = 11

b ☐ − 3 = 16

c 32 − ☐ = 24

d ☐ − 42 = 57

e 174 − ☐ = 62

f ☐ − 85 = 110

3 Have a go at these.

a 14 + ☐ = 76

b ☐ − 37 = 51

c 23 + ☐ = 84

d ☐ − 121 = 57

e 232 + ☐ = 496

f ☐ − 236 = 151

Name ..... Class ..... Date .....

Use the relationship between addition and subtraction to solve missing number problems.

1 Complete the following.

a ☐ + 42 = 96

b 123 + ☐ = 387

c ☐ + 375 = 427

d 124 + ☐ = 203

e ☐ + 752 = 934

f 384 + ☐ = 1637

2 Now try these.

a ☐ − 53 = 26

b 168 − ☐ = 104

c ☐ − 69 = 134

d ☐ − 89 = 47

e 7084 − ☐ = 243

f ☐ − 2085 = 289

3 Have a go at these.

a 156 + ☐ = 378

b ☐ − 157 = 123

c ☐ + 285 = 536

d ☐ − 246 = 178

e 637 + ☐ = 1719

f ☐ − 1187 = 3539

Name ..... Class ..... Date .....

Use the relationship between addition and subtraction to solve missing number problems.

1 Complete the following by filling in all the boxes with the numbers from the first equation. An example is shown.

a

13 + 54 = 67

so 54 + 13 = 67

and 67 − 54 = 13

and 67 − 13 = 54

b

85 − 33 = 52

so 85 − ☐ = ☐

and ☐ + ☐ = 85

and ☐ + ☐ = ☐

c

144 + 24 = 168

so 168 − ☐ = ☐

and ☐ + ☐ = ☐

and ☐ − ☐ = ☐

d

127 − 83 = 44

so ☐ + ☐ = 127

and ☐ + ☐ = ☐

and ☐ − ☐ = ☐

Continued overleaf

Name ..... Class ..... Date .....

e

423 + 68 = 491

so ☐ + ☐ = ☐

and ☐ − ☐ = ☐

and ☐ − ☐ = ☐

f

423 − 141 = 282

so ☐ + ☐ = ☐

and ☐ − ☐ = ☐

and ☐ + ☐ = ☐

g

306 + 124 = 430

so ☐ − ☐ = ☐

and ☐ − ☐ = ☐

and ☐ + ☐ = ☐

h

☐ − 431 = 157

so ☐ + ☐ = ☐

and ☐ − ☐ = ☐

and ☐ + ☐ = ☐

You're doing really well!

Name ..... Class ..... Date .....

Use the relationship between addition and subtraction to solve missing number problems.

1 Complete the following by filling in all the boxes with the numbers from the first equation. An example is shown.

a

	146	+	58	=	204	
so	58	+	146	=	204	
and	204	−	146	=	58	
and	204	−	58	=	146	

b

	165	−	63	=	102
so		−		=	
and		+		=	
and		+		=	

c

	432	+	51	=	
so		−		=	
and		+		=	
and		−		=	

d

	364	−		=	211
so		+		=	
and		+		=	
and		−		=	

Continued overleaf

Name ..... Class ..... Date .....

e

356 + ☐ = 862

so ☐ + ☐ = ☐

and ☐ − ☐ = ☐

and ☐ − ☐ = ☐

f

☐ − 336 = 386

so ☐ + ☐ = ☐

and ☐ − ☐ = ☐

and ☐ + ☐ = ☐

g

4723 + ☐ = 4999

so ☐ − ☐ = ☐

and ☐ − ☐ = ☐

and ☐ + ☐ = ☐

h

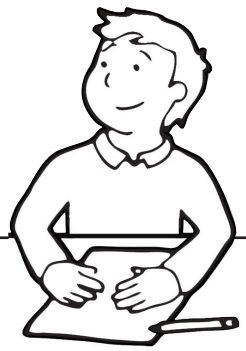
☐ − 1382 = 4650

so ☐ + ☐ = ☐

and ☐ + ☐ = ☐

and ☐ − ☐ = ☐

Well done!



Name ..... Class ..... Date .....

Use the relationship between addition and subtraction to solve missing number word problems.

1 Read each problem below. **Put a circle** around the equation you would use to solve the problem.

a There are 56 blue and red cars in the garage. 23 are blue. How many red cars are there?

$23 - 56 = ?$ $56 - 23 = ?$

$? - 23 = 56$ $56 + 23 = ?$

b Mrs Shah baked 86 cakes for her daughter's birthday party. After the party, 25 were left. How many cakes were eaten at the party?

$86 + 25 = ?$ $25 - 86 = ?$

$86 - 25 = ?$ $? - 25 = 86$

c From Monday to Thursday, Esme collected 43 house points. On Friday she gained another 14. How many house points did Esme collect altogether?

$43 - 14 = ?$ $43 + 14 = ?$

$43 - ? = 14$ $14 + ? = 43$

Continued overleaf

Name ..... Class ..... Date .....

2 Now try this

a Before lunch, Ruthie drove 56 miles. After lunch she drove 27 miles. How many miles had she driven altogether?

56 + ? = 27 56 + 27 = ?

27 − 56 = ? 56 − 27 = ?

b Use the equation you have chosen to find the answer to the problem.

3 Have a go at this one.

a Tom got his spending money on Saturday. He spent £3.50 at the shop and had £5.00 left. How much spending money had Tom received?

£3.50 + £5.00 = ? £5.00 + ? = £3.50

£3.50 − £5.00 = ? £5.00 − £3.50 = ?

b Use the equation you have chosen to find the answer to the problem.

£

Continued overleaf

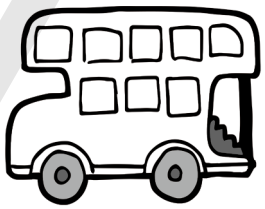
Name ..... Class ..... Date .....

4 For these problems, write down an equation you could use to solve the problem. Then use your equation to find the answer.

a 65 people were on the bus. Some more people got on at Greentree, but no one got off. Then there were 82 people on the bus. How many people got on at Greentree.

□ □ □ = □

You can use this space for your working.



b A shop had 79 iPads. On Monday it sold 23 iPads. How many iPads did the shop have left?

□ □ □ = □

You can use this space for your working.

c The classroom library had 126 books. 42 were out on loan. How many books were on the library book shelves?

□ □ □ = □

You can use this space for your working.

Name ..... Class ..... Date .....

Use the relationship between addition or subtraction to solve missing number word problems.

1 Read each problem below. **Put a circle around** the equation you would use to solve the problem.

a Afzal had 182 football cards altogether. 73 had a picture of a premiership player. How many cards did not have a picture of a permiership player?

73 + 182 = ? 182 − 73 = ?

73 − 182 = ? 182 + 73 = ?

b Mr Bread, the baker, sold 473 loaves, on Monday. On Tuesday he sold 189 loaves. How many loaves did Mr Bread sell altogether?

473 − 189 = ? 189 + ? = 473

473 + 189 = ? 189 − 473 = ?

c Jan's netball team scored 256 goals during the season. They had 79 goals scored against them. What was the difference between the goals for and against?

79 − 256 = ? 256 + 79 = ?

79 + 256 = ? 256 − 79 = ?

Continued overleaf

Name ..... Class ..... Date .....

2 Now try this

a Janey's family had to drive 1652 kilometres to their holiday destination. On the first day, they drove 967 kilometres. How much further did they have to drive?

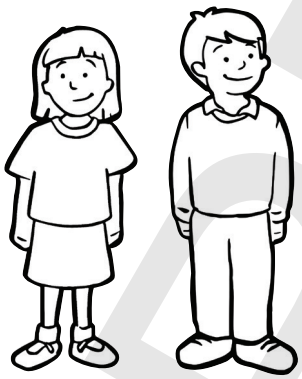
$1652 + 967 = ?$ $1652 - 967 = ?$

$1652 + ? = 967$ $967 - 1652 = ?$

b Use the equation you have chosen to find the answer to the problem.

3 Have a go at this one.

a 1908 pupils attend Sunnyside High School. 1184 are boys. How many are girls?



$1184 - 1908 = ?$ $1908 + 1184 = ?$

$1908 + ? = 1184$ $1908 - 1184 = ?$

b Use the equation you have chosen to find the answer to the problem.

Continued overleaf

Name ..... Class ..... Date .....

4 For these problems, write down an equation you could use to solve the problem. Then use your equation to find the answer.

a Anya was saving up for a laptop. She saved £375.50 from her earnings and £50.78 from her birthday money. How much did Anya save altogether?

£ ☐ £ = £

You can use this space for your working.

b The perimeter of a garden measured 156.35m. There was a fence aound 78.5 metres of the perimeter. How much of the garden's perimeter did not have a fence?

☐ ☐ ☐ = ☐

You can use this space for your working.

c To arrive at their holiday destination, Julian's family drove 87km before lunch and 87km after lunch. How far did they drive altogether?

☐ ☐ ☐ = ☐

You can use this space for your working.

Name ..... Class ..... Date .....

Use the relationship between multiplication and division to solve missing number problems.

1 Complete the following.

a ☐ x 4 = 24

b 6 x ☐ = 30

c 5 x ☐ = 60

d ☐ x 7 = 42

e 10 x ☐ = 150

f 8 x ☐ = 96

2 Now try these.

a ☐ ÷ 3 = 9

b ☐ ÷ 8 = 3

c 48 ÷ ☐ = 6

d ☐ ÷ 7 = 5

e 84 ÷ ☐ = 7

f ☐ ÷ 9 = 8

3 Have a go at these.

a ☐ x 5 = 40

b ☐ ÷ 6 = 7

c 6 x ☐ = 54

d ☐ ÷ 10 = 26

e 9 x ☐ = 108

f ☐ ÷ 7 = 14

Name ..... Class ..... Date .....

Use the relationship between multiplication and division to solve missing number problems.

1 Complete the following.

a ☐ x 12 = 84

b 11 x ☐ = 143

c ☐ x 15 = 180

d 25 x ☐ = 450

e ☐ x 14 = 728

f 23 x ☐ = 690

2 Now try these.

a ☐ ÷ 12 = 8

b 165 ÷ ☐ = 15

c ☐ ÷ 30 = 76

d 180 ÷ ☐ = 45

e ☐ ÷ 36 = 28

f ☐ ÷ 53 = 91

3 Have a go at these.

a ☐ x 30 = 930

b ☐ ÷ 42 = 23

c 35 x ☐ = 420

d ☐ ÷ 22 = 48

e 38 x ☐ = 608

f ☐ ÷ 72 = 21

Name ..... Class ..... Date .....

Use the relationship between multiplication and division to solve missing number problems.

1 Complete the following by filling in all the boxes with the numbers from the first equation. An example is shown.

a

	8	x	7	=	56
so	7	x	8	=	56
and	56	÷	7	=	8
and	56	÷	8	=	7

b

	54	÷	9	=	6
so	54	÷		=	9
and		x		=	54
and		x		=	

c

	12	x	8	=	96
so	96	÷		=	
and		x		=	
and		÷		=	

d

	78	÷	6	=	13
so		x		=	78
and		x		=	78
and		÷		=	

Continued overleaf

Name ..... Class ..... Date .....

e

13 x 15 = 195

so ☐ x ☐ = ☐

and ☐ ÷ ☐ = ☐

and ☐ ÷ ☐ = ☐

f

153 ÷ 9 = 17

so ☐ x ☐ = ☐

and ☐ ÷ ☐ = ☐

and ☐ x ☐ = ☐

g

23 x 12 = 276

so ☐ ÷ ☐ = ☐

and ☐ ÷ ☐ = ☐

and ☐ x ☐ = ☐

h

☐ ÷ 8 = 9

so ☐ x ☐ = ☐

and ☐ ÷ ☐ = ☐

and ☐ x ☐ = ☐

You're doing a great job!

Name ..... Class ..... Date .....

Use the relationship between multiplication and division to solve missing number problems.

1 Complete the following by filling in all the boxes with the numbers from the first equation. An example is shown.

a

	13	x	21	=	273
so	21	x	13	=	273
and	273	÷	13	=	21
and	273	÷	21	=	13

b

	322	÷	14	=	23
so		÷		=	
and		x		=	
and		x		=	

c

	14	x	16	=	
so		÷		=	
and		x		=	
and		÷		=	

d

	345	÷		=	15
so		x		=	
and		x		=	
and		÷		=	

Continued overleaf

Name ..... Class ..... Date .....

e

	17	x		=	442
so		x		=	
and		÷		=	
and		÷		=	

f

		÷	26	=	52
so		x		=	
and		÷		=	
and		x		=	

g

		x	32	=	800
so		÷		=	
and		x		=	
and		÷		=	

h

		÷	56	=	21
so		x		=	
and		x		=	
and		÷		=	

Keep up the good work!

Name ..... Class ..... Date .....

Use multiplication or division to solve missing number word problems.

1 Read each problem below. **Put a circle** around the equation you would use to solve the problem.

a Baz, Gracie and Shazia share £27 evenly between themselves. How much does Gracie get?

£23 x 3 = ? 3 x £27 = ?

£27 ÷ 3 = ? 3 ÷ £27 = ?

b In the reception class, there are ten books in each reading box. There are eight reading boxes. How many books are there altogether?

10 ÷ 8 = ? 10 x 8 = ?

10 x ? = 8 8 ÷ 10 = ?

c Six friends had £2.50 each to go to the fair. How much had they altogether?

6 x ? = £2.50 £2.50 ÷ 6 = ?

£2.50 x 6 = ? 6 ÷ £2.50 = ?

Continued overleaf

Name ..... Class ..... Date .....

2 Now try this

a Katya thought of a number and divided it by 9. Her answer was 12. What was Katya's number?

12 x ? = 9 9 x 12 = ?

12 ÷ 9 = ? 9 x ? = 12

b Use the equation you have chosen to find the answer to the problem.

3 Have a go at this one.

a Amir had the same number of marbles in each of 8 tubs. He had 56 marbles altogether. How many marbles were in one tub?

56 x 8 = ? 56 x ? = 8

56 ÷ 8 = ? 8 ÷ ? = 56

b Use the equation you have chosen to find the answer to the problem.

Continued overleaf

Name ..... Class ..... Date .....

4 For these problems, write down an equation you could use to solve the problem. Then use your equation to find the answer.

a Six friends each gave the same amount to the school charity fund. They gave £12 altogether. How much did they each give?

□ □ □ = □

You can use this space for your working.

b Laura, Riz and Chloe each swam 23 lengths of the pool. How many lengths did they swim altogether?

□ □ □ = □

You can use this space for your working.

c Brenda's Bakery sold 27 loaves of bread every day for 6 days. How many loaves did they sell altogether?

□ □ □ = □

You can use this space for your working.

Name ..... Class ..... Date .....

Use multiplication or division to solve missing number word problems.

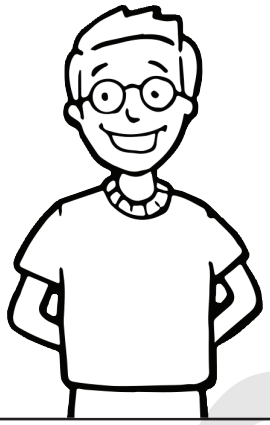
1 Read each problem below. **Put a circle** around the equation you would use to solve the problem.

a Seven people bought a ticket for a fairground ride. They paid £21.70 altogether. How much did each ticket cost?

£21.70 x 7 = ? 7 ÷ £21.70 = ?

£21.70 ÷ 7 = ? 7 x £21.70 = ?

b Archie saves £1.50 per week for 56 weeks. How much did he save altogether?



? x £1.50 = 56 £1.50 ÷ 56 = ?

56 ÷ £1.50 = ? £1.50 x 56 = ?

c A shop sells 592 bars of chocolate over 16 days. What is the average number of bars sold per day?

592 ÷ 16 = ? 592 x ? = 16

592 x 16 = ? 16 x ? = 592

Continued overleaf

Name ..... Class ..... Date .....

2 Now try this

a Asmat thought of a number and divided it by 18. His answer was 21. What was Asmat's number?

21 x 18 = ?

21 ÷ 18 = ?

18 x ? = 21

21 ÷ ? = 18

b Use the equation you have chosen to find the answer to the problem.

3 Have a go at this one.

a The pasta factory divided pasta between 56 bags with 55 grams in each bag. How much pasta was there to start with?

55g x ? = 56

56 ÷ 55g = ?

55g ÷ 56 = ?

56 x 55g = ?

b Use the equation you have chosen to find the answer to the problem.

g

Continued overleaf

Name ..... Class ..... Date .....

4 For these problems, write down an equation you could use to solve the problem. Then use your equation to find the answer.

a A box can hold 12 biscuits. How many boxes are needed to hold 768 biscuits?

□ □ □ = □

You can use this space for your working.

b Mo's teacher asked, "If a number divided by 32 is 98, what is the number?". What should Mo's answer have been?

□ □ □ = □

You can use this space for your working.

c An average of 872 people attended the local football team's matches over 22 games, during a season. How many people attended altogether?

□ □ □ = □

You can use this space for your working.

Name ..... Class ..... Date .....

Understand that any symbol can be used to represent numbers.

KEY

 = 6  = 48  = 24

 = 15  = 5  = 54

1 Use the key above to solve the following.

a  +  = ☐

b  −  = ☐

c  +  = ☐

d  −  = ☐

2 Now try these.

a  x  = ☐

b  ÷  = ☐

c  x  = ☐

d  ÷  = ☐

3 Have a go at these.

a  +  = ☐

b  −  = ☐

c  x  = ☐

d  ÷  = ☐

e  −  = ☐

f  x  = ☐

g  +  = ☐

h  ÷  = ☐

Name ..... Class ..... Date .....

Understand that any symbol can be used to represent numbers.

KEY

 = 9  = 105  = 135

 = 72  = 15  = 270

1 Use the key above to solve the following.

a  +  = ☐

b  −  = ☐

c  +  = ☐

d  −  = ☐

2 Now try these.

a  x  = ☐

b  ÷  = ☐

c  x  = ☐

d  ÷  = ☐

3 Have a go at these.

a  +  = ☐

b  −  = ☐

c  x  = ☐

d  ÷  = ☐

e  −  = ☐

f  x  = ☐

g  +  = ☐

h  ÷  = ☐

Name ..... Class ..... Date .....

Understand that any symbol can be used to represent numbers. Use the relationships between operations.

KEY

 = 6  = 48  = 24

 = 15  = 5  = 54

1 Use the key above to solve the following.

a  + ☐ = 18

b ☐ −  = 18

c  + ☐ = 96

d ☐ −  = 40

2 Now try these.

a  ÷ ☐ = 6

b ☐ x  = 45

c  x ☐ = 72

d ☐ ÷  = 6

3 Have a go at these.

a ☐ +  = 96

b  − ☐ = 6

c ☐ x  = 55

d 42 ÷ ☐ = 

e  x ☐ = 48

f ☐ −  = 25

g  + ☐ = 148

h ☐ ÷  = 7

Name ..... Class ..... Date .....

Understand that any symbol can be used to represent numbers. Use the relationships between operations.

KEY

 = 9  = 105  = 135

 = 72  = 15  = 270

1 Use the key above to solve the following.

a  + ☐ = 65

b ☐ −  = 72

c  + ☐ = 127

d ☐ −  = 241

2 Now try these.

a  ÷ ☐ = 45

b  x ☐ = 195

c  x ☐ = 630

d ☐ ÷  = 13

3 Have a go at these.

a ☐ +  = 204

b ☐ −  = 812

c  x ☐ = 864

d ☐ ÷  = 63

e  x ☐ = 6945

f ☐ −  = 864

g  + ☐ = 2164

h ☐ ÷  = 83

Name ..... Class ..... Date .....

Make both sides of an equation equal, where one side contains a missing number

1 Complete the following.

a) 4 + ☐ = 9 + 12

b) 27 − 9 = ☐ − 4

c) 4 x ☐ = 2 x 12

d) 42 ÷ 7 = ☐ ÷ 2

e) 12 + 23 = ☐ + 15

f) 69 − ☐ = 57 − 12

g) 81 ÷ ☐ = 54 ÷ 6

h) 8 x 13 = ☐ x 2

i) 66 ÷ ☐ = 72 ÷ 12

j) 46 + 32 = 24 + ☐

k) 14 x 8 = ☐ x 7

l) ☐ − 28 = 72 − 34

Continued overleaf

Name ..... Class ..... Date .....

2 Now try these.

a) 26 + ☐ = 44 − 10

b) 49 − ☐ = 21 + 21

c) 3 x 2 = ☐ ÷ 5

d) 96 ÷ 8 = ☐ x 4

e) ☐ + 15 = 34 − 7

f) 29 + 33 = ☐ − 15

g) 2 x ☐ = 72 ÷ 9

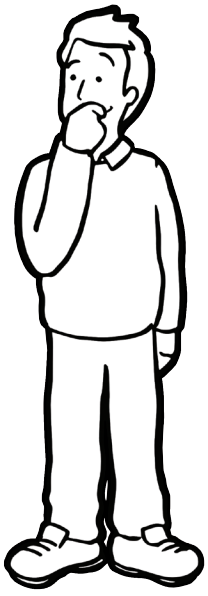
h) ☐ ÷ 7 = 2 x 28

i) 82 − ☐ = 39 + 24

j) 4 x ☐ = 160 ÷ 10

k) 157 − 42 = ☐ + 100

l) ☐ ÷ 4 = 6 x 5



Continued overleaf

Name ..... Class ..... Date .....

3 Have a go at these. They may be tricky - look carefully at the operations!

a) 8 + ☐ = 6 x 5

b) 54 ÷ 9 = ☐ − 23

c) 7 x ☐ = 37 − 9

d) 7 + 5 = ☐ ÷ 2

e) ☐ x 7 = 49 + 14

f) 84 − ☐ = 13 + 4

g) 64 ÷ ☐ = 7 + 9

h) 96 ÷ 3 = 17 + ☐

i) 84 x 3 = 102 + ☐

j) 29 + 17 = 92 ÷ ☐

k) 466 − ☐ = 4 x 61

l) ☐ ÷ 9 = 18 x 4

Continued overleaf

Name ..... Class ..... Date .....

4 Now try these. Think carefully.

a) 23 + 49 = 8 x ☐ = 104 − 32

b) ☐ − 69 = 96 ÷ 4 = 12 x 2

c) 105 ÷ 3 = 7 x 5 = 18 + ☐

d) 360 − 296 = ☐ ÷ 8 = 25 + 39

e) 56 + 32 = ☐ x 11 = 176 ÷ 2 = ☐ − 14

f) ☐ + 79 = 8 x 21 = ☐ ÷ 1 = 392 − 224

g) 6 x 23 = 150 − ☐ = 276 ÷ ☐ = 60 + 78

h) 45 + ☐ = 450 ÷ 3 = 6 x ☐ = 232 − 82

Making good progress!

Name ..... Class ..... Date .....

Make both sides of an equation equal, where one side contains a missing number

1 Complete the following by putting the missing numbers in the boxes.

a) 26 + ☐ = 21 + 34

b) 54 − 27 = ☐ − 38

c) 12 x ☐ = 39 x 4

d) 198 ÷ 11 = ☐ ÷ 6

e) 106 + 49 = 76 + ☐

f) 113 − 37 = ☐ − 87

g) 364 ÷ ☐ = 338 ÷ 13

h) 34 x 23 = 17 x ☐

i) 143 + 268 = ☐ + 327

j) 391 ÷ ☐ = 578 ÷ 34

k) 5.2 x 35 = 8 x ☐

l) ☐ − 246 = 356.5 − 78

Continued overleaf

Name ..... Class ..... Date .....

2 Complete the following by putting the missing numbers in the boxes.

a) 53 + ☐ = 193 − 78

b) 3576 − ☐ = 323 + 859

c) 26 x 24 = ☐ ÷ 13

d) ☐ x 1.5 = 432 ÷ 18

e) ☐ + 15.7 = 63.8 − 14.9

f) 56.4 + 32.5 = ☐ − 36

g) ☐ x 3.6 = 81 ÷ 18

h) ☐ ÷ 5 = 98 x 12

i) 1643 − ☐ = 592 + 356.8

j) 27 x ☐ = 1134 ÷ 12

k) 6049 − 32.42 = ☐ + 5894

l) ☐ ÷ 3.5 = 3.84 x 25

Continued overleaf

Name ..... Class ..... Date .....

3 Have a go at these. They may be tricky - look carefully at the operations.

a) 98 + ☐ = 64 x 2.5

b) 630 ÷ 18 = ☐ − 164.5

c) 4.5 x ☐ = 1064 − 785

d) 1063 + 2458 = ☐ ÷ 9

e) ☐ x 2.7 = 45.25 + 105.95

f) 742.6 − ☐ = 36.23 x 18

g) 408 ÷ ☐ = 6.38 + 17.62

h) 2470 ÷ 26 = 72.68 + ☐

i) 1262 x 18 = 9852 + ☐

j) 8.423 + 39.577 = 1680 ÷ ☐

k) 82291 − ☐ = 1364 x 56

l) ☐ ÷ 2.7 = 1006 − 824.1

Continued overleaf

Name ..... Class ..... Date .....

4 Now try these. Think carefully.

a) 156 + 456 = 18 x ☐ = 1242 − 630

b) ☐ − 6369 = 36 ÷ 2.4 = 12 x 1.25

c) 1352 ÷ 26 = 16 x 3.25 = 36.23 + ☐

d) 857.3 − 789.3 = ☐ ÷ 4.2 = 36.248 + 31.752

e) 23.29 + 13.71 = ☐ x 18.5 = 240.5 ÷ 6.5 = ☐ − 56.64

f) ☐ + 52.31 = 27 x 3.21 = ☐ ÷ 11 = 130.17 − 43.5

You're doing well!

Part 2

Year 6 (and beyond) Expectations

Name ..... Class ..... Date .....

Begin to use letters to represent variables.

1 Put the missing numbers in the boxes.

a ☐ + 33 = 49

b 56 − ☐ = 4

c  x 6 = 48

 = ☐

d 128 −  = 14

 = ☐

2 In algebra, instead of symbols to represent numbers, we can use letters.

a $x + 26 = 54$

$x =$ ☐

b $27 - y = 19$

$y =$ ☐

c $42 + a = 68$

$a =$ ☐

d $b - 27 = 62$

$b =$ ☐

e $48 + y = 92$

$y =$ ☐

f $x - 24 = 48$

$x =$ ☐

g $b + 47 = 152$

$b =$ ☐

h $183 - a = 127$

$a =$ ☐

Continued overleaf

Name ..... Class ..... Date .....

3 Now try these.

a $x \times 5 = 55$

$x = \square$

b $36 \div y = 4$

$y = \square$

c $9 \times a = 45$

$a = \square$

d $b \div 7 = 6$

$b = \square$

e $12 \times y = 72$

$y = \square$

f $x \div 11 = 11$

$x = \square$

g $b \times 8 = 96$

$b = \square$

h $108 \div a = 12$

$a = \square$

4 Have a go at these. Take care - the operations are mixed up.

a $68 + x = 94$

$x = \square$

b $y - 52 = 39$

$y = \square$

c $9 \times a = 108$

$a = \square$

d $b \div 3 = 32$

$b = \square$

e $y \times 7 = 56$

$y = \square$

f $184 - x = 141$

$x = \square$

g $b + 27 = 94$

$b = \square$

h $96 \div a = 8$

$a = \square$

Name ..... Class ..... Date .....

Begin to use letters to represent variables.

1 Put the missing numbers in the boxes.

a $\square + 43 = 126$

b $108 \div \square = 6$

c  $\times 12 = 108$

 $= \square$

d $374 -$  $= 87$

 $= \square$

2 In algebra, instead of symbols to represent numbers, we can use letters.

a $x + 159 = 264$

$x = \square$

b $232 - y = 87$

$y = \square$

c $118 + a = 423$

$a = \square$

d $b - 157 = 348$

$b = \square$

e $487 + y = 726$

$y = \square$

f $x - 324 = 287$

$x = \square$

g $b + 267 = 1486$

$b = \square$

h $1462 - a = 744$

$a = \square$

Continued overleaf

Name ..... Class ..... Date .....

3 Now try these.

a $x \times 12 = 228$

$x =$ ☐

b $195 \div y = 13$

$y =$ ☐

c $9 \times a = 234$

$a =$ ☐

d $b \div 14 = 53$

$b =$ ☐

e $17 \times y = 646$

$y =$ ☐

f $840 \div x = 21$

$x =$ ☐

g $b \times 24 = 1272$

$b =$ ☐

h $a \div 36 = 59$

$a =$ ☐

4 Have a go at these. Take care - the operations are mixed up.

a $152 + x = 932$

$x =$ ☐

b $y - 488 = 229$

$y =$ ☐

c $27 \times a = 999$

$a =$ ☐

d $b \div 23 = 831$

$b =$ ☐

e $y \times 36 = 180$

$y =$ ☐

f $123 - x = 84.2$

$x =$ ☐

g $b + 463.2 = 541.8$

$b =$ ☐

h $2688 \div a = 32$

$a =$ ☐

Name ..... Class ..... Date .....

Solve equations where letters represent missing numbers.

Remember, in algebra we can use letters to represent missing numbers.

1 Find the value of x or y in these equations. Put your answers in the boxes.

a $x + 3 = 14$

$x =$ ☐

c $8 + y = 22$

$y =$ ☐

b $7 + y = 18$

$y =$ ☐

d $x + 7 = 34$

$x =$ ☐

2 Now find the value of a or b in these.

a $6 - a = 2$

$a =$ ☐

c $b - 7 = 9$

$b =$ ☐

b $b - 4 = 12$

$b =$ ☐

d $17 - a = 8$

$a =$ ☐

3 Find the value of the letters in these mixed addition and subtraction equations.

a $14 + x = 18$

$x =$ ☐

d $y + 64 = 85$

$y =$ ☐

b $y - 6 = 37$

$y =$ ☐

e $a - 9 = 87$

$a =$ ☐

c $38 - b = 24$

$b =$ ☐

f $55 + x = 92$

$x =$ ☐

Continued overleaf

Name ..... Class ..... Date .....

4 Now try to find a or b in these equations.

a $a \times 3 = 24$

$a = \square$

b $4 \times b = 32$

$b = \square$

c $7 \times b = 35$

$b = \square$

d $a \times 9 = 63$

$a = \square$

5 What is the value of x or y?

a $21 \div y = 7$

$y = \square$

b $x \div 6 = 5$

$x = \square$

c $40 \div x = 8$

$x = \square$

d $y \div 6 = 9$

$y = \square$

6 Find the value of the letters in these mixed multiplication and division equations.

a $48 \div b = 12$

$b = \square$

b $8x = 48$ ($8x$ means the same as 8 x x)

$x = \square$

c $12a = 60$

$a = \square$

d $y \div 9 = 4$

$y = \square$

e $2x \div 8 = 7$

$x = \square$

Clue: Whatever you do to one side you must do to the other.

Example: $4x = 16$

To find the value of x, divide both sides by 4.

So $x = 4$

Continued overleaf

Name ..... Class ..... Date .....

7 Find the value of the letters in these equations. Take care - they are trickier and the operations are all mixed.

a $54 + x = 96$

$x =$ ☐

b $b \div 8 = 12$

$b =$ ☐

c $y - 57 = 32$

$y =$ ☐

d $6a = 72$

$a =$ ☐

e $252 - b = 41$

$b =$ ☐

f $7y = 84$

$y =$ ☐

g $160 \div a = 8$

$a =$ ☐

h $5x + 123 = 478$

$x =$ ☐

i $3y - 27 = 66$

$y =$ ☐

j $6 \times 2a = 120$

$a =$ ☐

k $6b \div 18 = 3$

$b =$ ☐

l $39 + 9x = 84$

$x =$ ☐

Name ..... Class ..... Date .....

Solve equations where letters represent missing numbers.

Remember, in algebra we can use letters to represent missing numbers.

1 Find the value of x or y in these equations. Put your answers in the boxes.

a $x + 52 = 197$

$x =$ ☐

c $y + 126 = 387$

$y =$ ☐

b $74 + y = 188$

$y =$ ☐

d $648 + x = 828$

$x =$ ☐

2 Now find the value of a or b in these.

a $178 - x = 56$

$x =$ ☐

c $743 - y = 471$

$y =$ ☐

b $y - 412 = 76$

$y =$ ☐

d $x - 354 = 237$

$x =$ ☐

3 Find the value of the letters in these mixed addition and subtraction equations.

a $127 + x = 436$

$x =$ ☐

d $y + 382 = 947$

$y =$ ☐

b $y - 284 = 173$

$y =$ ☐

e $a - 676 = 283$

$a =$ ☐

c $835 - b = 628$

$b =$ ☐

f $x + 423 = 1638$

$x =$ ☐

Continued overleaf

Name ..... Class ..... Date .....

4 Now try to find a or b in these equations.

a $a \times 12 = 144$

$a =$ ☐

c $b \times 8 = 112$

$b =$ ☐

b $11 \times b = 143$

$b =$ ☐

d $5 \times a = 950$

$a =$ ☐

5 What is the value of x or y?

a $238 \div y = 7$

$y =$ ☐

c $896 \div x = 8$

$x =$ ☐

b $x \div 9 = 74$

$x =$ ☐

d $y \div 13 = 27$

$y =$ ☐

6 Find the value of the letters in these mixed multiplication and division equations.

a $y \div 12 = 79$

$y =$ ☐

e $3a \div 27 = 14$

$a =$ ☐

b $9a = 279$ ($9a$ means the same as $9 \times a$)

$a =$ ☐

c $315 \div b = 15$

$b =$ ☐

d $12x = 672$

$x =$ ☐

Clue: Whatever you do to one side you must do to the other.

Example: $4x = 16$

To find the value of x, divide both sides by 4.

So $x = 4$

Continued overleaf

Name ..... Class ..... Date .....

7 Find the value of the letters in these equations. Take care - they are trickier and the operations are all mixed.

a $436 + x = 843$

$x =$ ☐

b $b \div 52 = 48$

$b =$ ☐

c $y - 158 = 674$

$y =$ ☐

d $15a = 840$

$a =$ ☐

e $426 - b = 178$

$b =$ ☐

f $21y = 882$

$y =$ ☐

g $7668 \div 2a = 9$

$a =$ ☐

h $4x + 637 = 2329$

$x =$ ☐

i $2y - 749 = 873$

$y =$ ☐

j $594 \div 6a = 33$

$a =$ ☐

k $2b \div 46 = 137$

$b =$ ☐

l $326.8 + 7x = 482.9$

$x =$ ☐

Name ..... Class ..... Date .....

Solve equations where letters represent missing lengths.

1 Find the value of x or y in these equations. Put your answers in the boxes.

a $12\text{cm} + x = 19\text{cm}$

$x =$ ____ cm

c $38\text{mm} - y = 12\text{mm}$

$y =$ ____ mm

b $y - 4\text{m} = 16\text{m}$

$y =$ ____ m

d $b + 12\text{km} = 84\text{km}$

$b =$ ____ km

2 Now find the missing lengths in these multiplication or division equations.

a $8\text{km} \times y = 48\text{km}$

$y =$ ____ km

c $x \div 5\text{m} = 15\text{m}$

$x =$ ____ m

b $48\text{cm} \div a = 4\text{cm}$

$a =$ ____ cm

d $b \times 7\text{mm} = 84\text{mm}$

$b =$ ____ mm

3 What are the missing lengths?

a $82\text{m} - x = 21\text{m}$

$x =$ ____ m

d $2x \div 8\text{m} = 14\text{m}$

$x =$ ____ m

b $24\text{km} + a = 77\text{km}$

$a =$ ____ km

e $4b + 13\text{mm} = 33\text{mm}$

$b =$ ____ mm

c $y \times 12\text{cm} = 96\text{cm}$

$y =$ ____ cm

f $3y - 7\text{m} = 32\text{m}$

$y =$ ____ m

Name ..... Class ..... Date .....

Solve equations where letters represent missing lengths.

1 What are the missing lengths? Put your answers in the boxes.

a $72\text{cm} + x = 196\text{cm}$

$x =$ ____ cm

c $378\text{mm} - y = 158\text{mm}$

$y =$ ____ mm

b $a - 72\text{cm} = 123\text{m}$

$a =$ ____ m

d $b + 426\text{km} = 513\text{km}$

$b =$ ____ km

2 Now find the missing lengths in these multiplication or division equations.

a $7\text{km} \times y = 735\text{km}$

$y =$ ____ km

c $338\text{m} \div x = 26\text{m}$

$x =$ ____ m

b $a \div 8\text{cm} = 54\text{cm}$

$a =$ ____ cm

d $b \times 46\text{mm} = 736\text{mm}$

$b =$ ____ mm

3 What are the missing lengths?

a $552\text{m} - x = 327\text{m}$

$x =$ ____ m

d $4b \div 72\text{m} = 432\text{m}$

$b =$ ____ m

b $413\text{km} + a = 1623\text{km}$

$a =$ ____ km

e $2x + 14.34\text{cm} = 28.54\text{cm}$

$x =$ ____ cm

c $y \times 17\text{cm} = 595\text{cm}$

$y =$ ____ cm

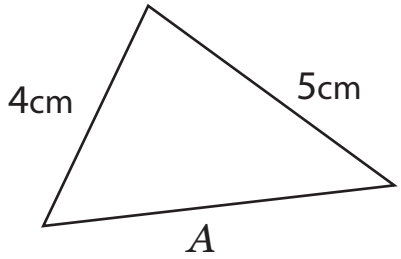
f $5y \times 3.2\text{m} = 112\text{m}$

$y =$ ____ m

Name ..... Class ..... Date .....

Solve equations where letters represent missing lengths in shapes.

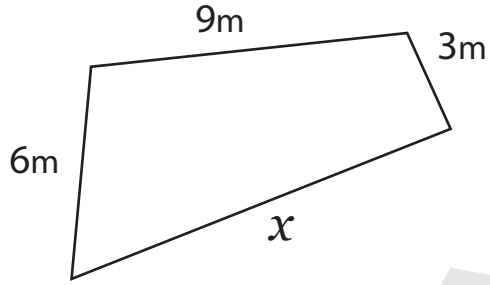
1 Look at the triangle below. Use the equation shown to find the length of side A.



$4\text{cm} + 5\text{cm} + A = 15\text{cm}$

$A =$ ☐ cm

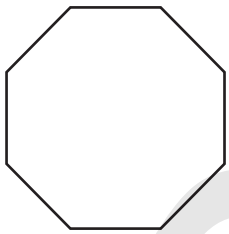
2 What is the length of the missing side in April's garden?



$28\text{m} = x + 9\text{m} + 3\text{m} + 6\text{m}$

☐ m $= x$

3 y centimetres represents the length of each side of a regular octagon. The perimeter of the octagon is 24mm.



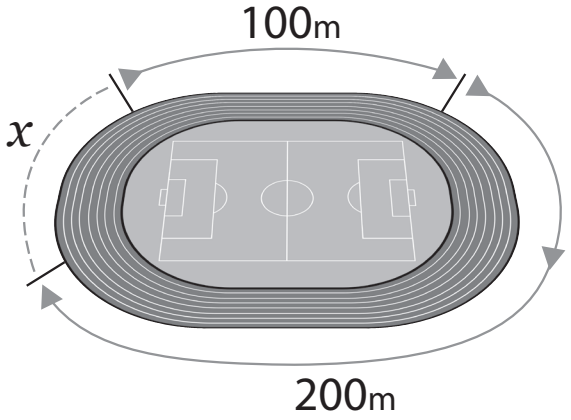
so $8y = 24\text{mm}$ ($8y$ means the same as 8 x y)

$y =$ ☐ mm

4 Look at the track. Use the equation to find the length of x.

$400\text{m} = 100\text{m} + x + 200\text{m}$

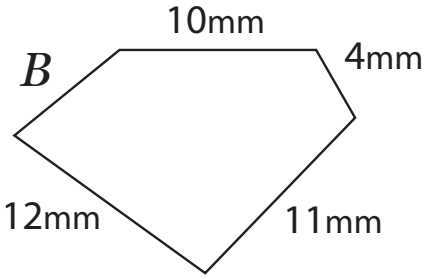
☐ m $= x$



Name ..... Class ..... Date .....

Solve equations where letters represent missing lengths in shapes.

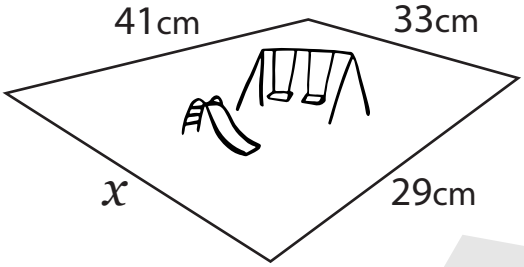
1 Look at the shape below. Use the equation shown to find the length of side B.



$42\text{mm} = 10\text{mm} + B + 12\text{mm} + 11\text{mm} + 4\text{mm}$

$\square\ \text{mm} = B$

2 What is the length of the missing side in the model playground below? Look carefully at the measurements.



$41\text{cm} + 33\text{cm} + 29\text{cm} + x = 1.5\text{m}$

$x = \square\ \text{cm}$

3 The perimeter of a regular nonagon-shaped lawn is 40.5 metres. The length of each side of the lawn is represented by y metres.

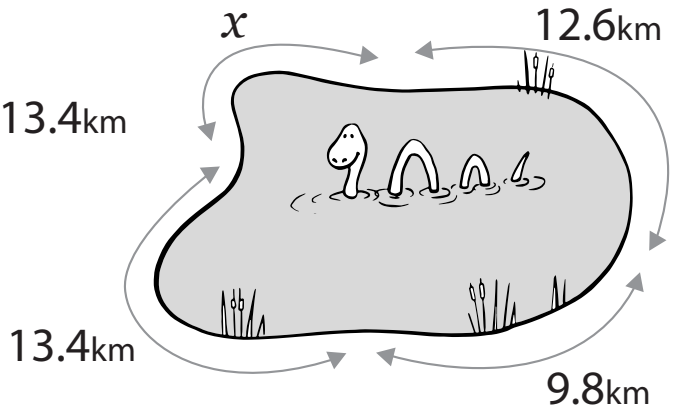
so $9y = 40.5\text{m}$ ($9y$ means the same as 9 x y)

$y = \square\ \text{m}$

4 Look at the lake. Use the equation to find the length of x.

$41\text{km} = x + 12.6\text{km} + 9.8\text{km} + 13.4\text{km}$

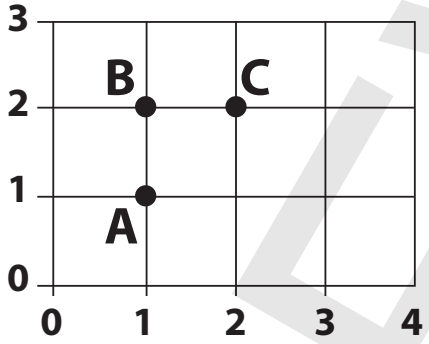
$\square\ \text{km} = x$

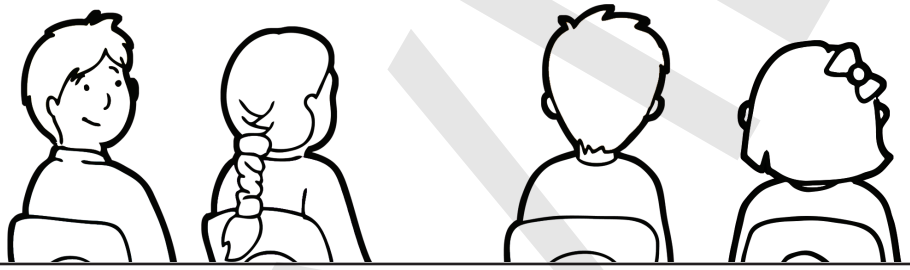


Name ..... Class ..... Date .....

Solve equations where letters represent missing co-ordinates..

1 Look at the co-ordinate grid and use it to answer the questions below.





a The co-ordinates of **A** are (1,1). What are the co-ordinates of **C**?

C = (..... , ...)

b Shape **ABCD** is a square. What are the co-ordinates of **D**?

D = (..... , ...)

c **F** is exactly the same distance from **C** as is **B**. What is the missing co-ordinate?

F = (..... , 2)

d Shape **ABFG** is a rectangle. What are the co-ordinates of **G**?

G = (..... , ...)

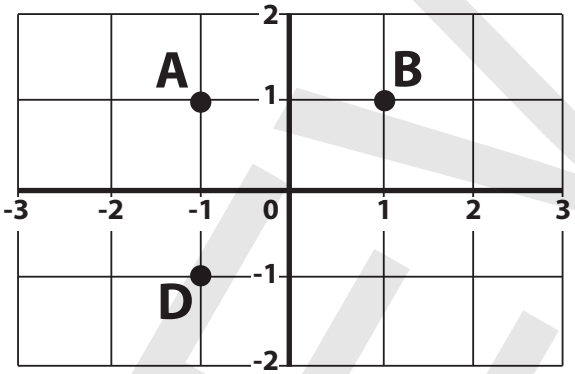
e If lines were drawn on the grid to make shape **ABG**, what would the shape be?

.....

Continued overleaf

Name ..... Class ..... Date .....

2 Look at the co-ordinate grid and use it to answer the questions below.



a What are the co-ordinates of **A** and **B**?

A = (..... , ...)

B = (..... , ...)

b Shape **ABCD** is a square. What are the co-ordinates of **C**?

C = (..... , ...)

c The triangle **ADF** is drawn on the grid. What could the missing co-ordinates be?

F = (2 , ...)

or **F** = (2 , ...)

or **F** = (2 , ...)

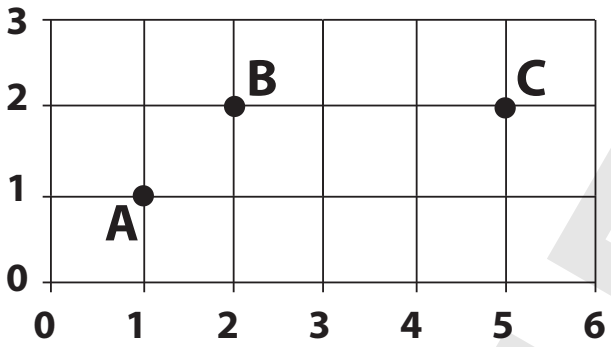
or **F** = (2 , ...)

or **F** = (2 , ...)

Name ..... Class ..... Date .....

Solve equations where letters represent missing co-ordinates..

1 Look at the co-ordinate grid and use it to answer the questions below.



a What are the co-ordinates of **A** , **B** and **C**?

A = (..... , ...) **B** = (..... , ...) **C** = (..... , ...)

b **ABCD** is a parallelogram. What are the co-ordinates of **D**?

D = (..... , ...)

c Line **BF** is perpendicular to the x-axis. What is the missing co-ordinate for point **F**?

F = (..... , 0)

d A line parallel to **AB** is drawn on the grid. The co-ordinates of one end of the line are (2, 0). What could the co-ordinates of the other end be (point **G**)?

G = (..... , ...)

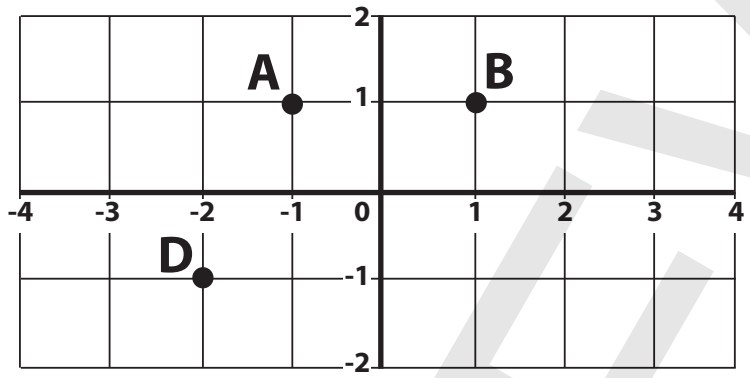
or **G** = (..... , ...)

or **G** = (..... , ...)

Continued overleaf

Name ..... Class ..... Date .....

2 Look at the co-ordinate grid and use it to answer the questions below.



a What are the co-ordinates of **A** , **B** and **D**?

A = (..... , ...) **B** = (..... , ...) **D** = (..... , ...)

b Shape **ABCD** is a trapezium. What are the co-ordinates of **C** if it is the same distance from the *y* axis as **D**?

C = (..... , ...)

c The rectangle **ABEF** is drawn on the grid. Side **BE** is parallel to the y-axis. What could the co-ordinates of **E** and **F** be?

E = (..... , ...) ***and*** **F** = (..... , ...)

or **E** = (..... , ...) ***and*** **F** = (..... , ...)

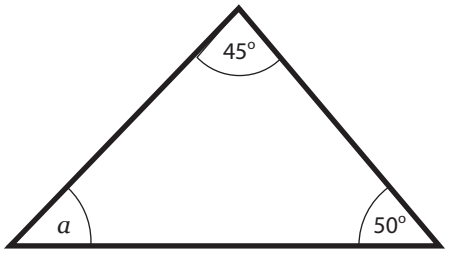
or **E** = (..... , ...) ***and*** **F** = (..... , ...)

or **E** = (..... , ...) ***and*** **F** = (..... , ...)

Name ..... Class ..... Date .....

Solve equations where letters represent missing angles.

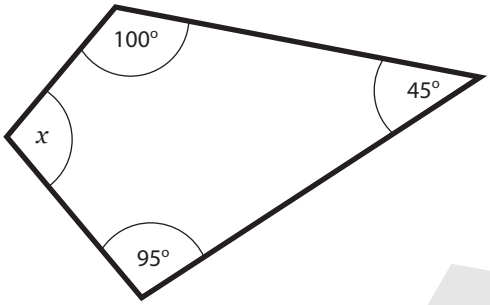
1 Use the equation to find the size of angle a.



$45° + 50° + a = 180°$

$a =$ ____ °

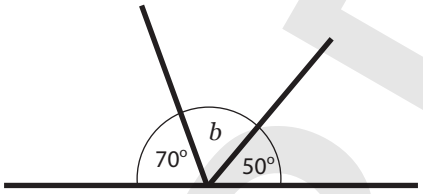
2 Find angle x in this shape.



$95° + 45° + 100° + x = 360°$

$x =$ ____ °

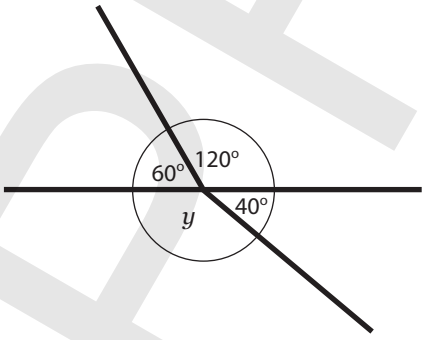
3 Find angle b.



$70° + 50° + b = 180°$

$b =$ ____ °

4 Find angle y.



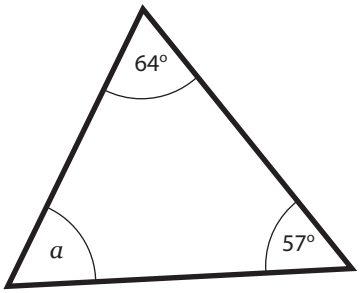
$120° + 40° + y + 60° = 360°$

$y =$ ____ °

Name ..... Class ..... Date .....

Solve equations where letters represent missing angles.

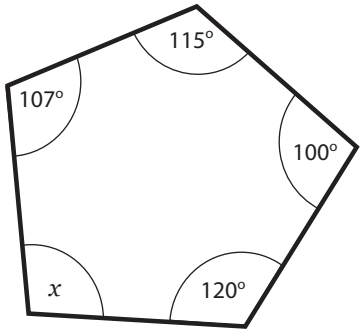
1 Use the equation to find the size of angle a.



$64° + 57° + a = 180°$

$a =$ ☐ °

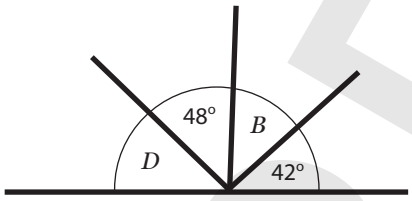
2 Find x in this shape.



$120° + 100° + 115° + 107° + x = 540°$

$x =$ ☐ °

3 Angle B, and angle D are equivalent. What is angle B?

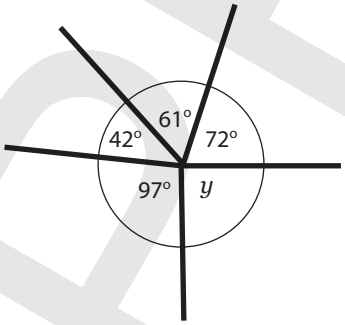


$D = B$

$D + 48° + 42° + B = 180°$

$B =$ ☐ °

4 How many degrees is angle y?



$61° + 72° + y + 97° + 42° = 360°$

$y =$ ☐ °

Name ..... Class ..... Date .....

Use simple formulae.

1 Use the formula below to find the area of the following rectangles.

A (Area) = l (length) x w (width)

a l = 3cm
w = 43cm
A = ____ cm²

b l = 6m
w = 9m
A = ____ m²

c l = 10mm
w = 46mm
A = ____ mm²

2 Now use the formula to find the missing width or length.

a l = 8cm
w = ____ cm
A = 24cm²

b l = ____ m
w = 9m
A = 63m²

c l = 15cm
w = ____ cm
A = 30cm²

3 Use the formula below to find the missing values in the table.

V (Volume) = (l) length x (w) width x (h) height

	l	w	h	V
Cuboid A	3cm	2cm	1cm	____ cm³
Cuboid B	5m	____ m	4m	20m³
Cuboid C	3mm	2mm	____ mm	36mm³
Cuboid D	____ cm	2cm	10cm	60cm³

Continued overleaf

Name ..... Class ..... Date .....

4 The formula for the area of a parallelogram is $A = b$ (base) x h. Use this to complete the table below.

	A	b	h
Parallelogram A	16cm^2	4cm	____ cm
Parallelogram B	____ m^2	8m	6m
Parallelogram C	54mm^2	____ mm	6mm

5 Use the formula below to find the missing values in the table below.

$$A = \frac{b \times h}{2} \text{ or } \tfrac{1}{2} \times b \times h$$

	A	b	h
Triangle A	____ cm^2	7cm	2cm
Triangle B	6cm^2	3cm	____ cm
Triangle C	10m^2	____ m	5m

6 In the formula $D = 2r$, D represents the diameter of a circle and r represents the radius. Use the formula to find the missing values.

	D	r
Circle A	____ cm	4cm
Circle B	12m	____ m
Circle C	24cm	____ cm
Circle D	____ m	13m

Continued overleaf

Name ..... Class ..... Date .....

ANGLE FACT BOX

Fact	Equation
The sum of the interior angles of a triangle is 180^o	$a + b + c = 180^o$
The sum of the interior angles of a quadrilateral is 360^o	$a + b + c + d = 360^o$
The sum of the interior angles of a pentagon is 540^o	$a + b + c + d + e = 540^o$

7 Use the equations shown in the fact box above to find the missing values.

Shape	Angle A	Angle B	Angle C	Angle D	Angle E
Triangle	64°	72°	☐°		
Quadrilateral	75°	95°	105°	☐°	
Square	☐°	☐°	☐°	☐°	
Pentagon	110°	100°	90°	☐°	140°
Regular Pentagon	☐°	108°	☐°	☐°	☐°

Name ..... Class ..... . Date ..... .

Use simple formulae.

1 Use the formula below to find the area of the following rectangles.

A (Area) = l (length) x h (height)

a l = 13cm
w = 8cm
A = ____ cm^2

b l = 27m
w = 9m
A = ____ m^2

c l = 23mm
w = 13mm
A = ____ mm^2

2 Now use the formula to find the missing width or length.

a l = 14cm
w = ____ cm
A = 98cm^2

b l = ____ m
w = 16m
A = 672m^2

c l = 24cm
w = ____ cm
A = 504cm^2

3 Use the formula below to find the missing values in the table.

V (Volume) = (l) length x (w) width x (h) height

	l	w	h	V
Cuboid A	4cm	____ cm	7cm	56cm^3
Cuboid B	8m	6m	9m	____ m^3
Cuboid C	4.5mm	2mm	____ mm	108mm^3
Cuboid D	____ cm	4cm	7cm	252cm^3

Continued overleaf

Name ..... Class ..... Date .....

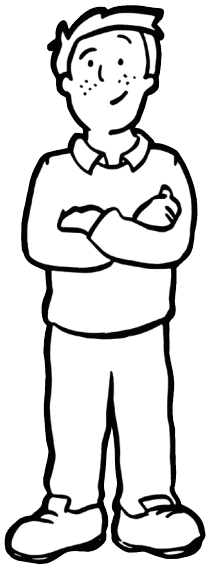
4 The formula for the area of a parallelogram is $A = b$ (base) x h. Use this to complete the table below.

	A	b	h
Parallelogram A	156cm^2	12cm	____ cm
Parallelogram B	____ m^2	15m	16m
Parallelogram C	374mm^2	22mm	____ mm

5 Use the formula below to find the missing values in the table below.

$$A = \frac{b \times h}{2} \text{ or } \tfrac{1}{2} \times b \times h$$

	A	b	h
Triangle A	____ cm^2	8cm	29cm
Triangle B	300cm^2	5cm	____ cm
Triangle C	496m^2	____ m	16m



6 In the formula $D = 2r$, D represents the diameter of a circle and r represents the radius. Use the formula to find the missing values.

	D	r
Circle A	____ m	57m
Circle B	1240cm	____ cm
Circle C	265m	____ m
Circle D	____ cm	7.25cm

Continued overleaf

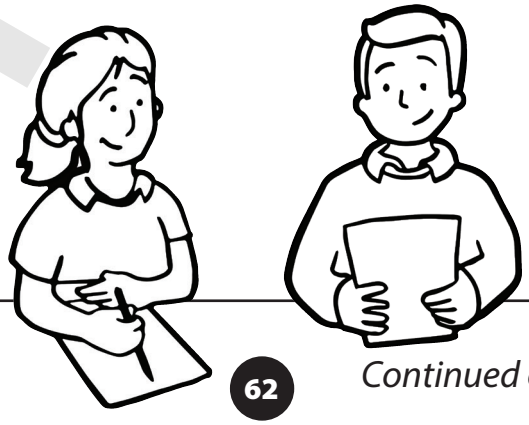
Name ..... Class ..... Date .....

ANGLE FACT BOX

Fact	Equation
The sum of the interior angles of a triangle is 180^o	$a + b + c = 180^o$
The sum of the interior angles of a quadrilateral is 360^o	$a + b + c + d = 360^o$
The sum of the interior angles of a pentagon is 540^o	$a + b + c + d + e = 540^o$

7 Use the equations shown in the fact box above to find the missing values.

Shape	Angle A	Angle B	Angle C	Angle D	Angle E
Triangle	62.5°	78°	°		
Equilateral Triangle	°	°	°		
Square	°	°	°	°	
Pentagon	116°	104.5°	87.5°	°	141°
Regular Pentagon	°	°	°	°	°



Continued overleaf

Name ..... Class ..... Date .....

Look at the formula. n represents the number of sides.

$(n - 2) \times 180^{o}$ = sum of the interior angles of any polygon

8 Use this formula to complete the missing values in the polygons below.

	Number of sides (name of shape)	Sum of interior angles	Each interior angle of the regular polygon
a	9 (nonagon)	☐ °	☐ °
b	10 (decagon)	☐ °	☐ °
c	☐	1080°	☐ °

d Now use the formula to find the missing angle in the irregular hexagon below.

Angle A = 115° Angle B = 127°

Angle C = 120° Angle D = 131°

Angle E = 112° Angle F = ☐ °

e Write down a possible combination for the angles in a pentagon (5 sides).

.....

Well done!

Name ..... Class ..... Date .....

Generate and describe linear number sequences.

1 For each number sequence below, find the rule to describe the pattern and write the missing numbers.

EXAMPLE

4, 8, 12, 16, 20 24 28

add 4

a) 9, 14, 19, 24, ☐ ☐ ☐

b) 45, 54, ☐ 72, ☐ 90, ☐

c) 78 67, ☐ 45, 34 ☐ ☐

d) 5, 2, -1, -4, ☐ ☐ ☐

e) 125, ☐ 75, 50, ☐ 0, ☐

Continued overleaf

Name ..... Class ..... Date .....

2 Now try these. **Clue** - the pattern isn't just adding or subtracting.

a) 2, 4, 8, ☐ 32, ☐ ☐

.....

b) 1, 4, 16, 64, ☐ ☐ ☐

.....

c) 729, 243, ☐ 27, 9, ☐ ☐

.....

d) 320, 160, 80, ☐ 20, ☐ ☐

.....

e) 0.04, 0.2, 1, 5, ☐ ☐ ☐

.....

f) 1.25, 2.5, 5, 10, ☐ ☐ ☐

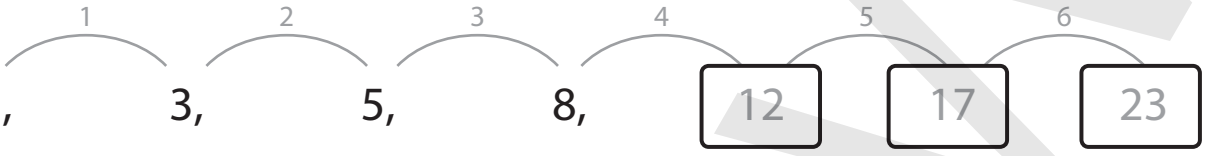
.....

Continued overleaf

Name ..... Class ..... Date .....

3 For these, you will need to find the pattern in the difference between the numbers.

EXAMPLE



increase | **decrease** difference by (**1**) | **2** and (**add**) | **subtract**

a 8, 10, 13, 17, ☐ ☐ ☐

increase | **decrease** difference by **1** | **2** and **add** | **subtract**

b 25, 24, 22, 19, ☐ ☐ ☐

increase | **decrease** difference by **1** | **2** and **add** | **subtract**

c 2, 12, 21, 29, ☐ ☐ ☐

increase | **decrease** difference by **1** | **2** and **add** | **subtract**

4 Now have a go at writing the full rule and finding the missing numbers.

a 1, 2, 5, 10, ☐ ☐ ☐

increase | **decrease** difference by **1** | **2** and **add** | **subtract**

b 50, 40, 31, 23, ☐ ☐ ☐

increase | **decrease** difference by **1** | **2** and **add** | **subtract**

Continued overleaf

Name ..... Class ..... Date .....

5 Describe how these numbers are special and complete the sequence.

a 1, 4, 9, ☐ 25, ☐ ☐

.....

b 2, 3, 7, ☐ 13, 17, ☐ ☐

.....

6 These are tricky! There are two rules.

EXAMPLE

+3 -2 +3 -2 +3 -2 +3

2, 5, 3, 6, 4, 7 5 8

add 3, subtract 2

a 4, 5, 3, 4, 2, ☐ ☐ ☐

.....

b 3, 8, 12, 17, 21, ☐ ☐ ☐

.....

c 25, 20, 22, 17, 19, ☐ ☐ ☐

.....

Name ..... Class ..... Date .....

Generate and describe linear number sequences.

1 For each number sequence below, find the rule to describe the pattern and write the missing numbers.

EXAMPLE

8, 14, 20, 26, 32, 38, 44

add 6

a) 61, 68, ☐, 82, ☐, ☐, ☐

b) 128, ☐, 106, 95, ☐, ☐, ☐

c) 17, 20, ☐, ☐, 29, ☐, 35, ☐

d) ☐, -3, 0, ☐, ☐, 9, 12, ☐

e) 65, ☐, ☐, 35, ☐, ☐, 5, ☐

Continued overleaf

Name ..... Class ..... Date .....

2 Now try these. **Clue** - the pattern isn't just adding or subtracting.

a) 4, ☐ ☐ 32, ☐ 128, ☐

.....

b) 8, ☐ 72, 216, ☐ 1944 ☐

.....

c) 176, ☐ 44, ☐ 11, 5.5, ☐

.....

d) 0.25, ☐ 1, ☐ 4, ☐ ☐

.....

e) 48, ☐ 12, ☐ ☐ 1.5 ☐

.....

f) ☐ ☐ 2, ☐ 0.5, 0.25, ☐

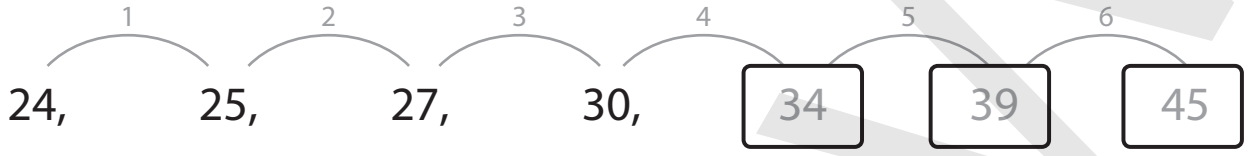
.....

Continued overleaf

Name ..... Class ..... Date .....

3 For these, you will need to find the pattern in the difference between the numbers.

EXAMPLE



increase | **decrease** difference by **1** | **2** | **3** and **add** | **subtract**

a 56, ☐ 53, 50, ☐ ☐ 35, ☐

increase | **decrease** difference by **1** | **2** | **3** and **add** | **subtract**

b 5, 15, 24, ☐ ☐ ☐ ☐ ☐

increase | **decrease** difference by **1** | **2** | **3** and **add** | **subtract**

4 Now have a go at writing the full rule and finding the missing numbers.

a 11, 10, ☐ 5, ☐ -4, ☐ ☐

increase | **decrease** difference by **1** | **2** | **3** and **add** | **subtract**

b ☐ 40, 33, 27, 22, ☐ ☐ ☐

increase | **decrease** difference by **1** | **2** | **3** and **add** | **subtract**

c ☐ 3, 1, -2, ☐ -11, ☐ ☐

increase | **decrease** difference by **1** | **2** | **3** and **add** | **subtract**

Continued overleaf

Name ..... Class ..... Date .....

5 Describe how these numbers are special and complete the sequence.

a ☐ 4, ☐ 16, ☐ ☐ 49, ☐

.....

b 37 ☐ ☐ ☐ 19 ☐ ☐ ☐

.....

6 These are tricky! There are two rules.

EXAMPLE

+4 -5 +4 -5 +4 -5

16 20 15 19 14 18 13

add 4, subtract 5

a 13, 17, 9, ☐ 5, ☐ ☐ 5, ☐

.....

b 8, 16, 14, 28, ☐ ☐ ☐ ☐ ☐

.....

c 5, 15, 17, ☐ 53, ☐ ☐ ☐ ☐

.....

Name ..... Class ..... Date .....

Use a formula to generate a number in a number sequence.

1 The formula for the sequence below is:

(n x 3) + 1 **(n = 1st, 2nd, 3rd, 4th number etc)**

4	**7**	**10**	**13**	**16**
1st	2nd	3rd	4th	5th

Use the formula to find the missing numbers in the sequence.

EXAMPLE

8th → (8 x 3) + 1 = 25

a 5th → ____ d 10th → ____

b 2nd → ____ e 1st → ____

c 9th → ____ f 12th → ____

---

2 Now use the formula **(n x 5) + 3** to fnd the missing numbers.

a 1st → ____ d 8th → ____

b 3rd → ____ e 10th → ____

c 5th → ____ f 14th → ____

You're doing a great job!

Name ..... Class ..... Date .....

Use a formula to generate a number in a number sequence.

1 The formula for the sequence **10**, **17**, **24**, **31** is **(n x 7) + 3**, where n represents the 1st, 2nd, 3rd number etc.

Use the formula to find the missing numbers in the sequence.

EXAMPLE

8th → (8 x 7) + 3 = 59

a 12th → ____ b 15th → ____

---

2 Now use the formula n^2 **x 2**

a 1st → ____ c 10th → ____

b 7th → ____ d 12th → ____

---

3 Have a go at using the formula n^3 **– 8**

a 4th → ____ c 1st → ____

b 5th → ____ d 2nd → ____

---

4 Write the first 5 numbers in the sequence using the formula **(n x 9) – 20**

____ ____ ____

____ ____

Name ..... Class ..... Date .....

Express missing number problems algebraically.

1 Complete the following.

a Jaz had 16 precious coins. He gave x coins to Afzal. He had 7 left. **Circle** the equation which would show how many precious coins Jaz gave to Afzal.

$16 \div x = 7$ $16 - x = 7$ $16 + 7 = x$

b David bought 8 packets of biscuits. Each packet had the same number of biscuits. There were 208 biscuits altogether. **Circle** the equation which could be used to work out how many biscuits were in each packet (y).

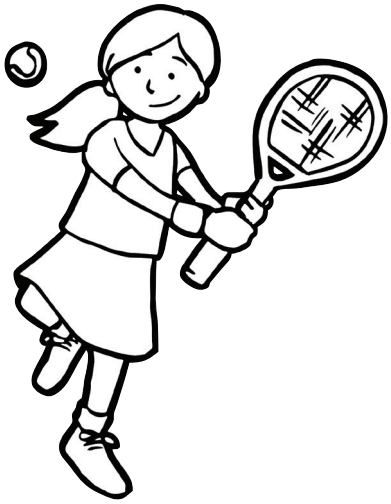
$y = 8 \times 208$ $y = 208 - 8$ $y = 208 \div 8$

c There are 18 tennis balls in the bag. 7 are green and x are orange. **Circle** the equation which could be used to find x.

$x - 18 = 7$

$18 = 7 + x$

$x = 7 - 18$



d Molly has £4. She spends £y at the shop. She has £1.50 left. **Circle** the equation which could be used to find y.

£y = £4 − £1.50 £1.50 + £4 = £y £4 = £1.50 − £y

Continued overleaf

Name ..... Class ..... Date .....

2 Write down a suitable equation you could use to solve the problems. Then solve them.

a A toy shop had 8 toy garages. Each garage had 4 toy cars. How many cars were there altogether (a)?

a = ☐☐☐ a = ☐

b A wall had 48 bricks. There were 23 old bricks and the rest were new. How many new bricks (b) were used in the wall?

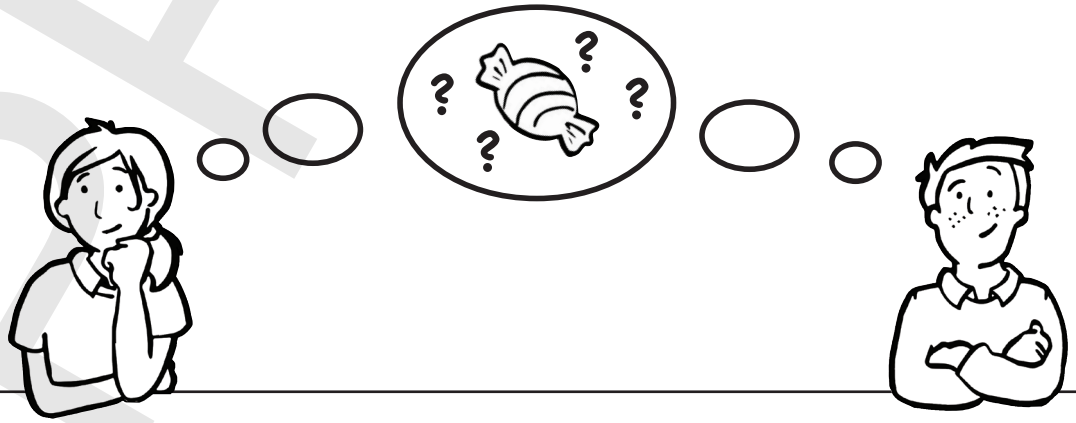
b = ☐☐☐ b = ☐

c The Crafty Cake Shop sells 4 birthday cakes on Monday. On Tuesday, it sells 5 times as many. How many birthday cakes did the shop sell on Tuesday (x)?

x = ☐☐☐ x = ☐

d Holly buys 27 sweets. Harry buys ⅓ as many. How many sweets does Harry buy (s)?

s = ☐☐☐ s = ☐



Name ..... Class ..... Date .....

Express missing number problems algebraically.

1 Complete the following.

a A bag contains x nails. Charlie used 56 to build a cabinet. There were 127 nails left in the bag. **Circle** the equation which could be used to work out how many nails were in the bag to start with.

$x = 127 - 56$

$x = 56 + 127$

$x = 56 \times 127$

b Gerry put the buns he had made into 14 tins. He had made 252 buns. **Circle** the equation which could be used to work out how many buns were in each tin (y).

$14 + 252 = y$ $\quad$ $252 \times 14 = y$ $\quad$ $252 \div 14 = y$

c Four friends went to a football match. They each paid £4.50 for a drink and a burger. **Circle** the equation which could be used to work out the total bill (b).

£4.50 + 4 = b $\quad$ £4.50 ÷ 4 = b $\quad$ £4.50 x 4 = b

d On Saturday 1364 people visited the Green Garden Centre. On Sunday 956 people visited. Circle the equation which could be used to work out how many people visited the garden centre altogether on Saturday and Sunday (a).

$1364 + 956 = a$ $\quad$ $1364 - 956 = a$ $\quad$ $1364 \div a = 956$

Continued overleaf

Name ..... Class ..... Date .....

2 Write down a suitable equation you could use to solve the problems. Then solve them.

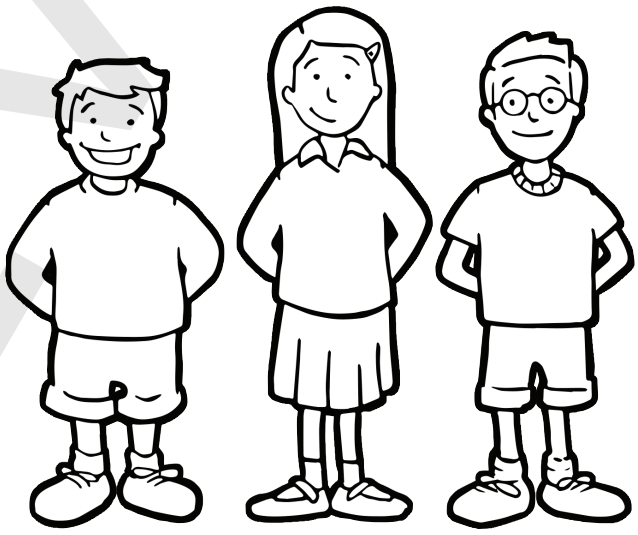
a 1486 people attend the Laid Back Leisure Centre over one weekend. 652 are female. How many are male (a)?

a = ☐ ☐ ☐ a = ☐

b There were three times as many tiles in the large pool as in the small pool. The small pool had 876 tiles. How many tiles were in the large pool (b)?

b = ☐ ☐ ☐ b = ☐

c Mrs Shah shared £24.45 evenly between her three children. How much did they each get (x)?



x = £ ☐ ☐

x = £

d Megan spent £2.64 on a necklace, £1.25 on some sweets and £15.72 on a present for her mum. How much did she spend altogether (y)? Write the full equation on the line.

..... y = £

Name ..... Class ..... Date .....

Solve equivalent expressions, where a letter represents one unknown number.

1 Find the missing numbers in the following.

a $5 + x = 4 + 11$

$x =$ ☐

b $38 - 9 = y - 3$

$y =$ ☐

c $6a = 3 \times 12$

$a =$ ☐

d $40 \div b = 24 \div 3$

$b =$ ☐

e $4y = 16 \times 2$

$y =$ ☐

f $4 + 23 = a + 21$

$a =$ ☐

g $x \div 4 = 70 \div 7$

$x =$ ☐

h $63 - b = 58 - 17$

$b =$ ☐

2 Now try these.

a $15 + x = 24 - 6$

$x =$ ☐

b $8 \times 7 = 112 \div y$

$y =$ ☐

c $59 - x = 31 + 23$

$x =$ ☐

d $72 \div 2 = 9b$

$b =$ ☐

e $98 - 49 = y + 3$

$y =$ ☐

f $a \div 3 = 6 \times 4$

$a =$ ☐

g $137 - 14 = x + 112$

$x =$ ☐

h $1.5b = 45 \div 3$

$b =$ ☐

Continued overleaf

Name ..... Class ..... Date .....

3 Have a go at these - look carefully at the operations.

a $14 + y = 3 \times 6$

$y =$ ☐

b $27 \div 9 = 52 - x$

$x =$ ☐

c $8b = 33 - 9$

$b =$ ☐

d $15 + 25 = a - 2$

$a =$ ☐

e $8x = 49 + 39$

$x =$ ☐

f $84 - a = 17 \times 3$

$a =$ ☐

g $288 \div y = 181 - 37$

$y =$ ☐

h $312 \div 3 = 67 + b$

$b =$ ☐

4 Now try these. Think carefully - they are tricky!

a $122 + 22 = 4y = 217 - 73$

$y =$ ☐

b $156 - a = 243 \div 3 = 3 \times 27$

$a =$ ☐

c $96 \div 12 = 0.5 \times 16 = 3.2 + x$

$x =$ ☐

d $206.5 + 0.5 = b \div 3 = 571 - 364$

$b =$ ☐

Name ..... Class ..... Date .....

Solve equivalent expressions, where a letter represents one unknown number.

1 Find the missing numbers in the following.

a $52 + x = 37 + 56$

$x =$ ☐

b $169 - 43 = y - 42$

$y =$ ☐

c $18a = 12 \times 9$

$a =$ ☐

d $182 \div b = 156 \div 12$

$b =$ ☐

e $91y = 26 \times 7$

$y =$ ☐

f $178 + 105 = a + 94$

$a =$ ☐

g $416 \div x = 128 \div 16$

$x =$ ☐

h $736 - b = 437 - 188$

$b =$ ☐

2 Now try these.

a $2917 + x = 4613 - 1212$

$x =$ ☐

b $56 \times 73 = y \div 7$

$y =$ ☐

c $9210 - x = 4164 + 2857$

$x =$ ☐

d $1125 \div 25 = 18b$

$b =$ ☐

e $9427 - 649 = y + 689$

$y =$ ☐

f $a \div 23 = 3.5 \times 16$

$a =$ ☐

g $9473 - 1849 = x + 3476$

$x =$ ☐

h $2.5b = 520.8 \div 8.4$

$b =$ ☐

Continued overleaf

Name ..... Class ..... Date .....

3 Have a go at these - look carefully at the operations.

a) $67 + y = 12 \times 13$

$y =$ ☐

b) $350 \div 14 = 113 - x$

$x =$ ☐

c) $567 \div b = 426 - 363$

$b =$ ☐

d) $1026 + 3728 = 7214 - a$

$a =$ ☐

e) $58x = 769 + 159$

$x =$ ☐

f) $6842 - a = 36 \times 53$

$a =$ ☐

g) $736 \div y = 47.63 - 15.63$

$y =$ ☐

h) $1512 \div 27 = 39.14 + b$

$b =$ ☐

4 Now try these. Think carefully - they are tricky!

a) $362.6 + 158.4 = 1042 \div y = 1341 - 820$

$y =$ ☐

b) $74.439 - a = 598 \div 23 = 3.25 \times 8$

$a =$ ☐

c) $3478 \div 37 = 37.6 \times 2.5 = 8.764 + x$

$x =$ ☐

d) $74.7 + 18.2 = b \div 4.2 = 1714 - 1621.1$

$b =$ ☐

Name ..... Class ..... Date .....

Find pairs of numbers that satisfy an equation with two unknowns.

1 For each of the following, find the value of △ . **Clue** - find the value of the other shapes first.

a □ = 23 − 5
□ = 14 + △
△ = □

b ○ = 32 ÷ 2
○ = △ x △
△ = □

c ⬡ = 4 x 9
⬡ = △ + △ + △
△ = □

d ⬠ = 52 − 27
⬠ = 43 − △
△ = □

2 Solve the following. **Clue** - one letter is easy to work out, so find that first.

a $x = 26 + 14$
$x = y + y$
$x =$ □

b $y = 8 \times 8$
$y = 73 - a$
$a =$ □

c $b = 99 \div 11$
$b = 6 + x$
$x =$ □

d $a = 97 - 76$
$a = b \div 3$
$b =$ □

e $63 + 14 = y$
$85 - x = y$
$x =$ □

f $b = 13 \times 4$
$b = 104 \div y$
$y =$ □

Continued overleaf

Name ..... Class ..... Date .....

3 Have a go at solving these.

a $17 + a = 21$

$b = 2a$

$b =$ ☐

b $56 \div x = 7$

$x = y + y$

$y =$ ☐

c $10b = 80$

$x = b + 31$

$x =$ ☐

d $y - 16 = 17$

$a + y = 41$

$a =$ ☐

4 Try these - they are getting even trickier!

a $27 \div a = 3$

$a + 2 = 44 \div b$

$b =$ ☐

b $14 - y = 9$

$20 + y = 31 - x$

$x =$ ☐

c $2b = 30$

$27 - b = 2y$

$y =$ ☐

d $x + 38 = 44$

$2x = y - 9$

$y =$ ☐

e $b - 15 = 35$

$4a = b - 18$

$a =$ ☐

f $3y = 60$

$y - 9 = x \div 2$

$x =$ ☐

Continued overleaf

Name ..... Class ..... Date .....

5 Have a go at these. You will need to think very carefully!

a
$$4x = 24 \div 2$$
$$22 + x = 30 - y$$
$$y = \square$$

b
$$35 \div a = 3 + 4$$
$$4a = 23 - b$$
$$b = \square$$

c
$$y - 14 = 3 \times 2$$
$$y \div 4 = 1 + x$$
$$x = \square$$

d
$$b + 57 = 12 \times 5$$
$$5a = b + 17$$
$$a = \square$$

e
$$x + 6 = 5 + 8$$
$$y \div 2 = 5x$$
$$y = \square$$

f
$$30 - 6 = 12a$$
$$13b = a + 128$$
$$b = \square$$

6 These are very challenging! Try them.

a
$$x + 4 = 4 + 11 + 5$$
$$x \div 2 = 2 + a$$
$$a = \square$$

b
$$4 + y + 3 = 8 \times 2$$
$$60 + x = 7y$$
$$x = \square$$

c
$$a + 7 = 3 \times 9$$
$$y = a + a + 4$$
$$y = \square$$

d
$$8b = 97 - 9$$
$$b - 2 = 12 - y$$
$$y = \square$$

Name ..... Class ..... Date .....

Find pairs of numbers that satisfy an equation with two unknowns.

1 For each of the following, find the value of △ . **Clue** - find the value of the other shapes first.

a □ = 179 − 23
□ = 119 + △
△ = ☐

b ○ = 144 ÷ 4
○ = △ x △
△ = ☐

c ⬡ = 9 x 12
⬡ = △ + △ + △ + △
△ = ☐

d ⬠ = 156 − 68
⬠ = 124 − △
△ = ☐

2 Solve the following. **Clue** - one letter is easy to work out, so find that first.

a $x = 127 + 43$
$x = y + y$
$y =$ ☐

b $y = 13 \times 13$
$y = 204 - a$
$a =$ ☐

c $b = 350 \div 14$
$b = x^2$
$x =$ ☐

d $a = 314 - 179$
$a = b \div 8$
$b =$ ☐

e $474 + 383 = y$
$1068 - x = y$
$x =$ ☐

f $b = 36 \times 14$
$b = 1008 \div y$
$y =$ ☐

Continued overleaf

Name ..... Class ..... Date .....

3 Have a go at solving these.

a $156 + a = 242$

$b = 7a$

$b =$ ☐

b $992 \div x = 8$

$x = y + y$

$y =$ ☐

c $26b = 650$

$x = b + 987$

$x =$ ☐

d $y - 176 = 243$

$a + y = 736$

$a =$ ☐

4 Try these - they are getting even trickier!

a $516 \div a = 12$

$a + 7 = 250 \div b$

$b =$ ☐

b $407 - y = 392$

$y^2 = 307 - x$

$x =$ ☐

c $18b = 306$

$173 - b = 12y$

$y =$ ☐

d $x + 1147 = 1489$

$13x = y - 63$

$y =$ ☐

e $b - 843 = 1069$

$23a = b - 1843$

$a =$ ☐

f $14y = 1022$

$y - 59 = x \div 27$

$x =$ ☐

Continued overleaf

Name ..... Class ..... Date .....

5 Have a go at these. You will need to think very carefully!

a
$$12x = 420 \div 5$$
$$426 + x = 531 - y$$
$$y = \square$$

b
$$154 \div a = 4 + 7$$
$$26a = 578 - b$$
$$b = \square$$

c
$$y - 89 = 13 \times 25$$
$$y \div 9 = 32 + x$$
$$x = \square$$

d
$$b + 661 = 43 \times 18$$
$$14a = b + 69$$
$$a = \square$$

e
$$x + 159 = 77 + 108$$
$$y \div 8 = 17x$$
$$y = \square$$

f
$$1072 - 888 = 8a$$
$$25b = a + 1027$$
$$b = \square$$

6 These are very challenging! Try them.

a
$$x + 327 = 136 + 258 + 89$$
$$x \div 12 = 7.5 + a$$
$$a = \square$$

b
$$68 + y + 75 = 51 \times 4$$
$$317 + x = 9y$$
$$x = \square$$

c
$$a + 326 = 17 \times 26$$
$$y = a + a + 76$$
$$y = \square$$

d
$$18b = 1272 - 624$$
$$b - 6 = 20y$$
$$y = \square$$

Name ..... Class ..... Date .....

Enumerate the possibilities of two variables.

1 Look at each of the equations below. Find 3 different pairs of values for a and b.

a a x b = 24

□ x □ = 24

□ x □ = 24

□ x □ = 24

b a ÷ b = 8

□ ÷ □ = 8

□ ÷ □ = 8

□ ÷ □ = 8

c a + b = 26

□ + □ = 26

□ + □ = 26

□ + □ = 26

d a − b = 4

□ − □ = 4

□ − □ = 4

□ − □ = 4

e a x b = 36

□ x □ = 36

□ x □ = 36

□ x □ = 36

f a + b = 30

□ + □ = 30

□ + □ = 30

□ + □ = 30

g a − b = 6

□ − □ = 6

□ − □ = 6

□ − □ = 6

h a ÷ b = 10

□ ÷ □ = 10

□ ÷ □ = 10

□ ÷ □ = 10

Continued overleaf

Name ..... Class ..... Date .....

2 For these, find the different values of x and y.

a x x y = 28

□ x □ = 28

□ x □ = 28

□ x □ = 28

b x x y = 40

□ x □ = 40

□ x □ = 40

□ x □ = 40

□ x □ = 40

c x ÷ 2 = y

□ ÷ 2 = y

□ ÷ 2 = y

□ ÷ 2 = y

□ ÷ 2 = y

d x + y + 3 = 16

□ + □ + 3 = 16

□ + □ + 3 = 16

□ + □ + 3 = 16

e x + y = 27

□ + □ = 27

□ + □ = 27

□ + □ = 27

f x − y = 9

□ − □ = 9

□ − □ = 9

□ − □ = 9

□ − □ = 9

Continued overleaf

Name ..... Class ..... Date .....

3 Try these.

a There are 6 sweets in a bag. Some are chewy and some are soft. Use the equation $c + s = 6$ and list all the possible combinations of chewy and soft sweets.

b $xy = 12$. In the space below, list all the possible combinations of x and y (x and y are whole numbers).

c There were 30 children at a party. The number of boys (b) was greater than 9 and fewer than 16, and the number of girls was greater than 14 and fewer than 21. Use the equation $b + g = 30$ to find all the possible combinations of boys and girls.

Name ..... Class ..... Date .....

Enumerate the possibilities of two variables.

1 Look at each of the equations below. Find 3 different pairs of values for a and b.

a

$a \times b = 96$

$\square \times \square = 96$

$\square \times \square = 96$

$\square \times \square = 96$

b

$a \div b = 12$

$\square \div \square = 12$

$\square \div \square = 12$

$\square \div \square = 12$

c

$a + b = 77$

$\square + \square = 77$

$\square + \square = 77$

$\square + \square = 77$

d

$a - b = 17$

$\square - \square = 17$

$\square - \square = 17$

$\square - \square = 17$

e

$a \times b = 110$

$\square \times \square = 110$

$\square \times \square = 110$

$\square \times \square = 110$

f

$a + b = 155$

$\square + \square = 155$

$\square + \square = 155$

$\square + \square = 155$

g

$a - b = 39$

$\square - \square = 39$

$\square - \square = 39$

$\square - \square = 39$

h

$a \div b = 13$

$\square \div \square = 13$

$\square \div \square = 13$

$\square \div \square = 13$

Continued overleaf

Name ..... Class ..... Date .....

2 For these, find the different values of x and y.

a $x \times y = 156$

$\square \times \square = 156$

$\square \times \square = 156$

$\square \times \square = 156$

b $x \times y = 250$

$\square \times \square = 250$

$\square \times \square = 250$

$\square \times \square = 250$

$\square \times \square = 250$

c $x \div y = 25$

$\square \div \square = 25$

$\square \div \square = 25$

$\square \div \square = 25$

$\square \div \square = 25$

d $x + y + 57 = 94$

$\square + \square + 57 = 94$

$\square + \square + 57 = 94$

$\square + \square + 57 = 94$

e $x + y = 253$

$\square + \square = 253$

$\square + \square = 253$

$\square + \square = 253$

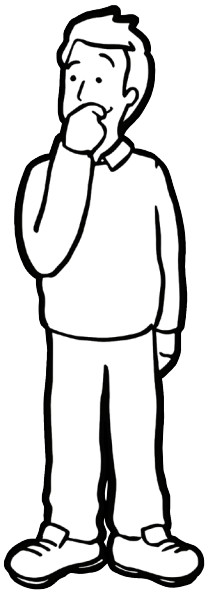
f $x + y = 127$

$\square + \square = 127$

$\square + \square = 127$

$\square + \square = 127$

$\square + \square = 127$



Continued overleaf

Name ..... Class ..... Date .....

3 Try these.

a There were 16 biscuits in a packet. Some were plain (p) and some were chocolate (c). There were less than 8 chocolate biscuits. Use the equation $p + c = 16$ and list all the possible combinations of plain and chocolate biscuits.

b $xy = 20$. In the space below, list all the possible combinations of x and y (x and y are whole numbers).

c There were 40 children at the youth club. The number of boys (b) was greater than 19 and fewer than 26 and the number of girls (g) was greater than 14 and fewer than 21. Use the equation $g + b = 40$ to list all the possible combinations of boys and girls.

Name ..... Class ..... Date .....

Solve equations using the correct order of operations.

To make sure we carry out calculations in the correct order we use **BODMAS**.

B	O	D	M	A	S
brackets *2 (3 + 4) means the same as 2 x (3 + 4)*	**order** *(or other things e.g. - squares)*	**division**	**multiplication**	**addition**	**subtraction**

1 Use **BODMAS** to find the missing numbers in these equations.

a $x = (8 + 2) + 3$

$x =$ ☐

b $y = 15 \div (1 + 2)$

$y =$ ☐

c $a = 4 + 6 \times 8$

$a =$ ☐

d $b = 30 \div 2 - 6$

$b =$ ☐

e $y = 14 - (8 + 3)$

$y =$ ☐

f $a = 7 \times 4 + 3$

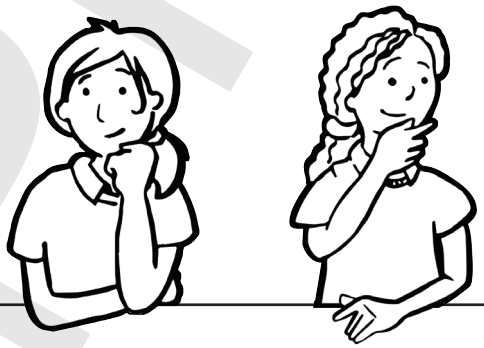
$a =$ ☐

g $52 - 42 \div 7 = x$

$x =$ ☐

h $b = 27 \times (16 - 15)$

$b =$ ☐



You're doing great!

Continued overleaf

Name ..... Class ..... Date .....

2 Try these. Think carefully.

a $(3 \times 4) + 8 = x$

$x =$ ☐

b $y = 3 + 6 \times 5$

$y =$ ☐

c $a = 2(12 + 36)$

$a =$ ☐

d $b = (14 + 10) \div (10 - 2)$

$b =$ ☐

e $2x = (2 \times 3) + 10$

$x =$ ☐

f $4a = 5 + (27 \div 9)$

$a =$ ☐

g $3y = (24 \div 3) + 7$

$y =$ ☐

h $3b = 3(5 + 1)$

$b =$ ☐

i $(17 - 6)4 = 4x$

$x =$ ☐

j $y = (24 - 4) \div (2 + 3)$

$y =$ ☐

k $4b = 4 + 24 \div 3 + 4$

$b =$ ☐

l $5x = 29 + 3(4 - 2)$

$x =$ ☐

m $4a = (27 \div 3)4 + 8$

$a =$ ☐

n $9y = 14 + 8(12 \div 2) - 8$

$y =$ ☐

Name ..... Class ..... Date .....

Solve equations using the correct order of operations.

To make sure we carry out calculations in the correct order, we use **BODMAS**.

B	O	D	M	A	S
brackets *2 (3 + 4) means the same as 2 x (3 + 4)*	**order** *(or other things e.g. - squares)*	**division**	**multiplication**	**addition**	**subtraction**

1 Use **BODMAS** to find the missing numbers in these equations.

a $x = (27 + 14) + 8$

$x =$ ☐

b $y = 48 \div (4 + 2)$

$y =$ ☐

c $a = 14 + 36 \times 3$

$a =$ ☐

d $b = 56 \div 8 \times 15$

$b =$ ☐

e $y = 156 - 12 \times 12$

$y =$ ☐

f $a = (158 + 10) \div 12$

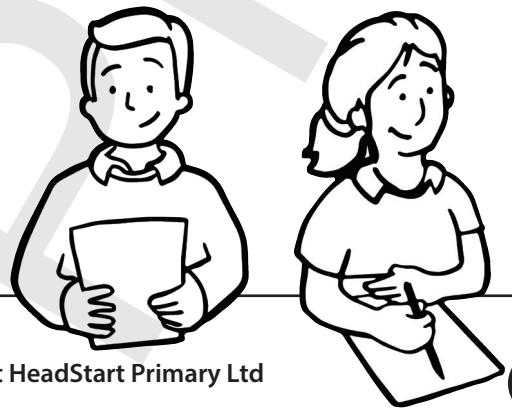
$a =$ ☐

g $372 - 162 \div 9 = 2x$

$x =$ ☐

h $3b = 42 + 16 \div 4 + 2$

$b =$ ☐



Good work!

Continued overleaf

Name ..... Class ..... Date .....

2 Try these. Think carefully.

a $(54 + 56) \div (73 - 62) = x$

$x =$ ☐

b $(-4 + 6)18 + 134 = 5y$

$y =$ ☐

c $12a = (-2 - 6) + (8 \times 7)$

$a =$ ☐

d $b = 8^2 \times 2$

$b =$ ☐

e $x = 6^2 \div (33 - 3 \times 8)$

$x =$ ☐

f $a = 541 - (127 + 7)\ 2^2$

$a =$ ☐

g $(-8 + 12) + 8 \times 9 = 2y$

$y =$ ☐

h $16^2 \div (48 - 16) = b$

$b =$ ☐

i $4 + 16(53 + 18) = x$

$x =$ ☐

j $8^2 + 2^2 + (1056 - 841) = y$

$y =$ ☐

k $172 + {}^{16}\!/_{4} = 16b$

$b =$ ☐

l $8 \times {}^{15}\!/_{3} + 8 = 4x$

$x =$ ☐

m $9^2 + (14 - 2)\ {}^{360}\!/_{180} = 5a$

$a =$ ☐

n $6^2 (156 + 84) - 460 = 4y$

$y =$ ☐

Name ..... Class ..... Date .....

Solve equations with an unknown number on both sides.

1 Solve the problems below.

EXAMPLE $5x + 4 = x + 12$

Whatever you do to one side you must do to the other.

STEP 1

Put the x terms on the same side of the equation by subtracting x from both sides.

$$5x - x + 4 = 12$$

STEP 2

Simplify.

$$4x + 4 = 12$$

STEP 3

Put the number terms on the same side of the equation by subtracting 4 from both sides.

$$4x = 12 - 4 = 8$$

STEP 4

To find the value of x, divide both sides by 4.

$$x = 8 \div 4 = 2$$

a $7y + 2 = y + 8$

STEP 1 .....

STEP 2 .....

STEP 3 .....

STEP 4 $y =$ ☐

b $8b + 4 = 3b + 14$

STEP 1 .....

STEP 2 .....

STEP 3 .....

STEP 4 $b =$ ☐

c $12x + 4 = 9x + 13$

STEP 1 .....

STEP 2 .....

STEP 3 .....

STEP 4 $x =$ ☐

d $15a + 6 = 9a + 30$

STEP 1 .....

STEP 2 .....

STEP 3 .....

STEP 4 $a =$ ☐

Continued overleaf

Name ..... Class ..... Date .....

2 Have a go at these. Think carefully about the steps.

a $34a + 1 = 18a + 17$

STEP 1 .....

STEP 2 .....

STEP 3 .....

STEP 4 $a =$ ☐

b $24x + 164 = 32x + 116$

STEP 1 .....

STEP 2 .....

STEP 3 .....

STEP 4 $x =$ ☐

c $42y + 28 = 100 + 6y$

STEP 1 .....

STEP 2 .....

STEP 3 .....

STEP 4 $y =$ ☐

d $4a + 82 = 16a + 22$

STEP 1 .....

STEP 2 .....

STEP 3 .....

STEP 4 $a =$ ☐

e $59b + 108 = 16 + 82b$

STEP 1 .....

STEP 2 .....

STEP 3 .....

STEP 4 $b =$ ☐

f $65x + 12 = 49x + 36$

STEP 1 .....

STEP 2 .....

STEP 3 .....

STEP 4 $x =$ ☐

g $3a + 27 = 9a + 12$

STEP 1 .....

STEP 2 .....

STEP 3 .....

STEP 4 $a =$ ☐

h $12y + 73 = 56 + 16y$

STEP 1 .....

STEP 2 .....

STEP 3 .....

STEP 4 $y =$ ☐

Continued overleaf

Name ..... Class ..... Date .....

3 Now try these. You will need to remember **BODMAS** as well.

a $(12a + 4a) + 27 = 6a + 67$

STEP 1 .....

STEP 2 .....

STEP 3 .....

STEP 4 $a =$ ☐

---

b $(4x + 2x) + 4 = 4x + 8$

STEP 1 .....

STEP 2 .....

STEP 3 .....

STEP 4 $x =$ ☐

---

c $34y + (2 + 1)4 = 76 + 2y$

STEP 1 .....

STEP 2 .....

STEP 3 .....

STEP 4 $y =$ ☐

---

d $(3 + 5)4 + 8b = 14b + 8$

STEP 1 .....

STEP 2 .....

STEP 3 .....

STEP 4 $a =$ ☐

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Page 1
1a) 5 **b)** 7 **c)** 61 **d)** 43 **e)** 113 **f)** 112
2a) 4 **b)** 19 **c)** 8 **d)** 99 **e)** 112 **f)** 195
3a) 62 **b)** 88 **c)** 61 **d)** 178 **e)** 264 **f)** 387

Page 2
1a) 54 **b)** 264 **c)** 52 **d)** 79 **e)** 182 **f)** 1253
2a) 79 **b)** 64 **c)** 203 **d)** 136 **e)** 6841 **f)** 2374
3a) 222 **b)** 280 **c)** 251 **d)** 424 **e)** 1082 **f)** 4726

Page 3
1a) Example **b)** correct combinations of 85, 33 & 52 **c)** correct combinations of 144, 24 & 168 **d)** correct combinations of 127, 83 & 44

Page 4
e) correct combinations of 423, 68 & 491
f) correct combinations of 423, 141 & 282
g) correct combinations of 306, 124 & 430
h) correct combinations of 588, 431 & 157

Page 5
1a) Example **b)** correct combinations of 165, 63 & 102 **c)** correct combinations of 432, 51 & 483 **d)** correct combinations of 364, 153 & 211

Page 6
e) correct combinations of 356, 506 & 862
f) correct combinations of 722, 336 & 386
g) correct combinations of 4723, 276 & 4999
h) correct combinations of 6032, 1382 & 4650

Page 7
1a) 56 – 23 **b)** 86 – 25 **c)** 43 + 14

Page 8
2a) 56 + 27 **b)** 83
3a) £3.50 + £5.00 **b)** £8.50

Page 9
4a) appropriate equation e.g. 82 - 65 = 17
b) appropriate equation e.g. 79 – 23 = 56
c) appropriate equation e.g. 126 – 42 = 84

Page 10
1a) 182 - 73 **b)** 473 + 189 **c)** 256 - 79

Page 11
2a) 1652 - 967 **b)** 685
3a) 1908 - 1184 **b)** 724

Page 12
4a) appropriate equation e.g. £375.50 + £50.78 = £426.28 **b)** appropriate equation e.g. 156.35 – 78.5 = 77.85 **c)** appropriate equation e.g. 87 km + 87 km = 174 km

Page 13
1a) 6 **b)** 5 **c)** 12 **d)** 6 **e)** 15 **f)** 12
2a) 27 **b)** 24 **c)** 8 **d)** 35 **e)** 12 **f)** 72
3a) 8 **b)** 42 **c)** 9 **d)** 260 **e)** 12 **f)** 98

Page 14
1a) 7 **b)** 13 **c)** 12 **d)** 18 **e)** 52 **f)** 30
2a) 96 **b)** 11 **c)** 2280 **d)** 4 **e)** 1008 **f)** 4823
3a) 31 **b)** 966 **c)** 12 **d)** 1056 **e)** 16 **f)** 1512

Page 15
1a) example **b)** correct combinations of 54, 9 & 6
c) correct combinations of 12, 8 & 96
d) correct combinations of 78, 6 & 13

Page 16
e) correct combinations of 13, 15 & 195 **f)** correct combinations of 153, 9 & 17 **g)** correct combinations of 23, 12 & 276 **h)** correct combinations of 72, 8 & 9

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1a) Example **b)** correct combinations of 322, 14 & 23 **c)** correct combinations of 14, 16 & 224 **d)** correct combinations of 345, 23 & 15

Page 18

e) correct combinations of 17, 26 & 442
f) correct combinations of 1352, 26 & 52
g) correct combinations of 25, 32 & 800
h) correct combinations of 1176, 56 & 21

Page19

1a) £27 ÷ 3 **b)** 10 x 8 **c)** £2.50 x 6

Page 20

2a) 9 x 12 **b)** 108
3a) 56 ÷ 8 **b)** 7

Page 21

4a) appropriate equation e.g. £12 ÷ £6 = £2
b) appropriate equation e.g. 23 x 3 = 69
c) appropriate equation e.g. 27 x 6 = 162

Page 22

1a) £21.70 ÷ 7 **b)** £1.50 x 56 **c)** 592 ÷ 16

Page23

2a) 21 x 18 **b)** 378
3a) 56 x 55g **b)** 3080g

Page 24

4a) appropriate equation e.g. 768 ÷ 12 = 64
b) appropriate equation e.g. 98 x 32 = 3136
c) appropriate equation e.g. 872 x 22 = 19184

Page 25

1a) 21 **b)** 19 **c)** 69 **d)** 30
2a) 30, **b)** 3 **c)** 75 **d)** 4
3a) 72 **b)** 33 **c)** 144 **d)** 9 **e)** 39 **f)** 288 **g)** 102 **h)** 8

Page 26

1a) 24 **b)** 63 **c)** 87 **d)** 63
2a) 135 **b)** 8 **c)** 648 **d)** 7
3a) 207 **b)** 90 **c)** 2430 **d)** 9 **e)** 198 **f)** 9720 **g)** 342 **h)** 30

Page 27

1a) 3 **b)** 23 **c)** 42 **d)** 88
2a) 8 **b)** 9 **c)** 12 **d)** 90
3a) 72 **b)** 48 **c)** 11 **d)** 7 **e)** 2 **f)** 79 **g)** 100 **h)** 105

Page 28

1a) 56 **b)** 87 **c)** 55 **d)** 346
2a) 3 **b)** 13 **c)** 6 **d)** 936
3a) 69 **b)** 1082 **c)** 12 **d)** 6615 **e)** 463 **f)** 1134 **g)** 2092 **h)** 8715

Page 29

1a) 17 **b)** 22 **c)** 6 **d)** 12 **e)** 20 **f)** 24 **g)** 9 **h)** 52 **i)** 11 **j)** 54 **k)** 16 **l)** 66

Page 30

2a) 8 **b)** 7 **c)** 30 **d)** 3 **e)** 12 **f)** 77 **g)** 4 **h)** 392 **i)** 19 **j)** 4 **k)** 15 **l)** 120

Page 31

3a) 22 **b)** 29 **c)** 4 **d)** 24 **e)** 9 **f)** 67 **g)** 4 **h)** 15 **i)** 150 **j)** 2 **k)** 222 **l)** 648

Page 32

4a) 9 **b)** 93 **c)** 17 **d)** 512 **e)** 8, 102 **f)** 89,168 **g)** 12, 2 **h)** 105, 25

Page 33

1a) 29 **b)** 65 **c)** 13 **d)** 108 **e)** 79 **f)** 163 **g)** 14 **h)** 46 **i)** 84 **j)** 23 **k)** 22.75 **l)** 524.5

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Page 34

2a) 62 **b)** 2394 **c)** 8112 **d)** 16 **e)** 33.2 **f)** 124.9
g) 1.25 **h)** 5880 **i)** 694.2 **j)** 3.5 **k)** 122.58 **l)** 336

Page 35

3a) 62 **b)** 199.5 **c)** 62 **d)** 31689 **e)** 56 **f)** 90.46
g) 17 **h)** 22.32 **i)** 12864 **j)** 35 **k)** 5907 **l)** 491.13

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4a) 34 **b)** 6384 **c)** 15.77 **d)** 285.6 **e)** 2, 93.64
f) 34.36, 953.37

Page 37

1a) 16 **b)** 52 **c)** 8 **d)** 114
2a) 28 **b)** 8 **c)** 26 **d)** 89 **e)** 44 **f)** 72 **g)** 105 **h)** 56

Page 38

3a) 11 **b)** 9 **c)** 5 **d)** 42 **e)** 6 **f)** 121 **g)** 12 **h)** 9
4a) 26 **b)** 91 **c)** 12 **d)** 96 **e)** 8 **f)** 43 **g)** 67 **h)** 12

Page 39

1a) 83 **b)** 18 **c)** 9 **d)** 287
2a) 105 **b)** 145 **c)** 305 **d)** 505 **e)** 239 **f)** 611
g) 1219 **h)** 718

Page 40

3a) 19 **b)** 15 **c)** 26 **d)** 742 **e)** 38 **f)** 40 **g)** 53 **h)** 2124
4a) 780 **b)** 717 **c)** 37 **d)** 19113 **e)** 5 **f)** 38.8 **g)** 78.6
h) 84

Page 41

1a) 11 **b)** 11 **c)** 14 **d)** 27
2a) 4 **b)** 16 **c)** 16 **d)** 9
3a) 4 **b)** 43 **c)** 14 **d)** 21 **e)** 96 **f)** 37

Page 42

4a) 8 **b)** 8 **c)** 5 **d)** 7
5a) 3 **b)** 30 **c)** 5 **d)** 54
6a) 4 **b)** 6 **c)** 5 **d)** 36 **e)** 28

Page 43

7a) 42 **b)** 96 **c)** 89 **d)** 12 **e)** 211 **f)** 12 **g)** 20
h) 71 **i)** 31 **j)** 10 **k)** 9 **l)** 5

Page 44

1a) 145 **b)** 114 **c)** 261 **d)** 180
2a) 122 **b)** 488 **c)** 272 **d)** 591
3a) 309 **b)** 457 **c)** 207 **d)** 565 **e)** 959 **f)** 1215

Page 45

4a) 12 **b)** 13 **c)** 14 **d)** 190
5a) 34 **b)** 666 **c)** 112 **d)** 351
6a) 948 **b)** 31 **c)** 21 **d)** 56 **e)** 126

Page 46

7a) 407 **b)** 2496 **c)** 832 **d)** 56 **e)** 248 **f)** 42
g) 426 **h)** 423 **i)** 811 **j)** 3 **k)** 3151 **l)** 22.3

Page 47

1a) 7cm **b)** 20m **c)** 26mm **d)** 72km
2a) 6km **b)** 12cm **c)** 75m **d)** 12mm
3a) 61m **b)** 53km **c)** 8cm **d)** 56m **e)** 5mm **f)** 13m

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1a) 124cm **b)** 195m **c)** 220mm **d)** 87km
2a) 105km **b)** 432cm **c)** 13m **d)** 16mm
3a) 225m **b)** 1210km **c)** 35cm **d)** 7776m
e) 7.1cm **f)** 7m

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1) 6cm **2)** 10m **3)** 3mm **4)** 100m

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1) 5mm **2)** 47cm **3)** 4.5m **4)** 5.2km

Page 51

1a) 2,2 **b)** 2,1 **c)** 3 **d)** 3,1 **e)** triangle

Page 52

2a) A = -1,1 B = 1,1 **b)** 1, -1 **c)** 2 ,1, 0, -1, or -**2)**

Page 53

1a) A = 1,1 B = 2,2 C = 5,2 **b)** 4,1 **c)** 2 **d)** 3,1, 4,2, or 5,3

Page 54

2a) A = -1,1 B = 1,1 D = -2,-1 **b)** 2, -1 **c)** E = 1,2 and F = -1,2:1,0 and -1, 0:1, -1 and -1,-1 or 1,-2 and -1,-2

Page 55

1) 85° **2)** 120° **3)** 60° **4)** 140°

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1) 59° **2)** 98° **3)** 45° **4)** 88°

Page 57

1a) 12cm^2 **b)** 54m^2 **c)** 460mm^2
2a) 3cm **b)** 7m **c)** 2cm
3a) 6cm^3 **B)** 1m **C)** 6mm **D)** 3cm

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4a) 4cm **B)** 48m^2 **C)** 9mm
5a) 7cm^2 **B)** 4cm **C)** 4m
6a) 8cm **B)** 6m **C)** 12cm **D)** 26m

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7) Triangle - 44°, Quadrilateral - 85°, Square – all 90°, Pentagon - 100°, Regular Pentagon – all 108°

Page 60

1a) 104cm^2 **b)** 243m^2 **c)** 299mm^2
2a) 7cm **b)** 42m **c)** 21cm
3a) 2cm **B)** 432m^3 **C)** 12mm **D)** 9cm

Page 61

4A) 13cm **B)** 240m^2 **C)** 17mm
5A) 116cm^2 **B)** 120cm **C)** 62m
6A) 114m **B)** 620cm **C)** 132.5m **D)** 14.5cm

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7) Triangle – 39.5°, Equilateral Triangle - all 60°, Square – all 90°, Pentagon - 91°, Regular Pentagon – all 108°

Page 63

8a) 1260°, 140° **b)** 1440°, 144 **c)** 8(octago**n**), 135° **d)** 115° **e)** any appropriate combination = 540°

Page 64

1a) add 5: 29, 34, 39 **b)** add 9: 63, 81, 99 **c)** subtract 11: 56, 23, 12 **d)** subtract 3: -7, -10, -13 **e)** subtract 25: 100, 25, -25

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2a) multiply by 2 or double: 16, 64, 128 **b)** multiply by 4: 256, 1024, 4096 **c)** divide by 3: 81, 3, 1 **d)** divide by 2 or half: 40, 10, 5 **e)** multiply by 5: 25, 125, 625 **f)** multiply by 2 or double: 20, 40, 80

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3a) increase, 1, add: 22, 28, 35 **b)** increase, 1, subtract: 15, 10, 4 **c)** decrease, 1, add: 36, 42, 47
4a) increase difference by 2 and add: 17, 26, 37 **b)** decrease difference by 1 and subtract: 16, 10, 5

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5a) square numbers: 16, 36, 49 **b)** prime numbers 11, 19, 23
6a) add 1, subtract 2: 3, 1, 2 **b)** add 5, add 4: 26, 30, 35 **c)** subtract 5, add 2: 14, 16, 11

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1a) add 7: 75, 89, 96, 103 **b)** subtract 11: 117, 84, 73, 62 **c)** add 3: 23, 26, 32, 38 **d)** add 3: -6, 3, 6, 15 **e)** subtract 10: 55, 45, 25, 15, -5

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2a) multiply by 2 or double: 8, 16, 64, 256 **b)** multiply by 3: 24, 648, 5832 **c)** divide by 2 or half: 88, 22, 2.75 **d)** multiply by 2 or double: 0.5, 2, 8, 16 **e)** divide by 2 or half: 24, 6, 3, 0.75 **f)** divide by 2 or half: 8, 4, 1, 0.125

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3a) increase, 1, subtract: 55, 46, 41, 28 **b)** decrease, 1, add: 32, 39, 45, 50, 54
4a) increase difference by 1 and subtract: 8, 1, -10, -17 **b)** decrease difference by 1 and subtract: 48, 18, 15, 13 **c)** increase difference by 1 and subtract: 4, -6, -17, -24

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5a) square numbers: 1, 9, 25, 36, 64 **b)** prime numbers 31, 29, 23, 17, 13, 11
6a) add 4, subtract 8: 13, 9, 1, -3
b) double, subtract 2: 26, 52, 50, 100, 98 **c)** multiply by 3, add 2: 51, 159, 161, 483, 485

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1a) (5 x **3**) + 1 = 16 **b)** (2 x **3**) + 1 = 7 **c)** (9 x **3**) + 1 = 28 **d)** (10 x **3**) + 1 = 31 **e)** (1 x **3**) + 1 = 4 **f)** (12 x **3**) + 1 = 37
2a) (1 x **5**) + 3 = 8 **b)** (3 x **5**) + 3 = 18 **c)** (5 x **5**) + 3 = 28 **d)** (8 x **5**) + 3 = 43 **e)** (10 x **5**) + 3 = 53 **f)** (14 x **5**) + 3 = 73

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1a) (12 x **7**) + 3 = 87 **b)** (15 x **7**) + 3 = 108
2a) $1^2 \times 2 = 2$ **b)** $7^2 \times 2 = 98$ **c)** $10^2 \times 2 = 200$
d) $12^2 \times 2 = 288$
3a) $4^3 - 8 = 56$ **b)** $5^3 - 8 = 117$ **c)** $1^3 - 8 = -7$ **d)** $2^3 - 8 = 0$
4) (1 x **9**) -20 = -11, (2 x **9**) -20 = -2, (3 x **9**) -20 = 7, (4 x **9**) -20 = 16, (5 x **9**) -20 = 25

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1a) circle round 16 – x = 7 **b)** circle round y = 208 ÷ 8 **c)** circle round 18 = 7 + x
d) circle round £y = £4 - £1.50

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2a) a = 8 x 4 = 32 **b)** b = 48 – 23 = 25 **c)** x = 5 x 4 = 20 **d)** s = 27 ÷ 3 = 9

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1a) circle round x = 56 + 127 **b)** circle round 252 ÷ 14 = y **c)** circle round £4.50 x 4 = b
d) circle round 1364 + 956 = a

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2a) a = 1486 – 652 = 834 **b)** b = 876 x 3 = 2628 **c)** x = £24.45 ÷ 3 = £8.15
d) y = £2.64 + £1.25 + £15.72 = £19.61

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1a) 10 **b)** 32 **c)** 6 **d)** 5 **e)** 8 **f)** 6 **g)** 40 **h)** 22

2a) 3 **b)** 2 **c)** 5 **d)** 4 **e)** 46 **f)** 72 **g)** 11 **h)** 10

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3a) 4 **b)** 49 **c)** 3 **d)** 42 **e)** 11 **f)** 33 **g)** 2 **h)** 37

4a) 36 **b)** 75 **c)** 4.8 **d)** 621

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1a) 41 **b)** 168 **c)** 6 **d)** 14 **e)** 2 **f)** 189 **g)** 52 **h)** 487

2a) 484 **b)** 28616 **c)** 2189 **d)** 2.5 **e)** 8089 **f)** 1288 **g)** 4148 **h)** 24.8

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3a) 89 **b)** 88 **c)** 9 **d)** 2460 **e)** 16 **f)** 4934 **g)** 23 **h)** 16.86

4a) 2 **b)** 48.439 **c)** 85.236 **d)** 390.18

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1a) 4 **b)** 4 **c)** 12 **d)** 18

2a) 20 **b)** 9 **c)** 3 **d)** 63 **e)** 8 **f)** 2

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3a) 8 **b)** 4 **c)** 39 **d)** 8

4a) 4 **b)** 6 **c)** 6 **d)** 21 **e)** 8 **f)** 22

Page 84

5a) 5 **b)** 3 **c)** 4 **d)** 4 **e)** 70 **f)** 10

6a) 6 **b)** 3 **c)** 44 **d)** 3

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1a) 37 **b)** 6 **c)** 27 **d)** 36

2a) 85 **b)** 35 **c)** 5 **d)** 1080 **e)** 211 **f)** 2

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3a) 602 **b)** 62 **c)** 1012 **d)** 317

4a) 5 **b)** 82 **c)** 13 **d)** 4509 **e)** 3 **f)** 378

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5a) 98 **b)** 214 **c)** 14 **d)** 13 **e)** 3536 **f)** 42

6a) 5.5 **b)** 232 **c)** 308 **d)** 1.5

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1a) answers from 1 x 24, 2 x 12, 3 x 8, 4 x 6 **b)** appropriate answers **c)** appropriate answers **d)** appropriate answers **e)** answers from 1 x 36, 2 x 18, 3 x 12, 4 x 9, 6 x 6 **f)** appropriate answers **g)** appropriate answers **h)** appropriate answers

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2a) 1 x 28, 2 x 14, 4 x 7 **b)** 1 x 40, 2 x 20, 4 x 10, 5 x 8 **c)** appropriate answers **d)** appropriate answers **e)** appropriate answers **f)** appropriate answers

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3a) 1 + 5, 2 + 4, 3 + 3, 4 + 2, 5 + 1 **b)** 1 x 12, 2 x 6, 3 x 4, 4 x 3, 6 x 2, 12 x 1 **c)** 10 + 20, 11 + 19, 12 + 18, 13 + 17, 14 + 16, 15 + 15

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1a) answers from 1 x 96, 2 x 48, 3 x 32, 4 x 24, 6 x 16, 8 x 12 **b)** appropriate answers **c)** appropriate answers **d)** appropriate answers **e)** answers from 1 x 110, 2 x 55, 5 x 22, 10 x 11 **f)** appropriate answers **g)** appropriate answers **h)** appropriate answers

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2a) answers from 1 x 156, 2 x 78, 3 x 52, 4 x 39, 6 x 26 **b)** 1 x 250, 2 x 125, 5 x 50, 10 x 25 **c)** appropriate answers **d)** appropriate answers **e)** appropriate answers **f)** appropriate answers

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14 + 2, 13 + 3, 12 + 4, 11 + 5, 10 + 6, 9 + 7 **b)** 1 x 20, 2 x 10, 4 x 5, 5 x 4, 10 x 2, 20 x 1 **c)** 20 + 20, 21 + 19, 22 + 18, 23 + 17, 24 + 16, 25 + 15

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1a) 13 **b)** 5 **c)** 52 **d)** 9 **e)** 3 **f)** 31 **g)** 46 **h)** 27

Page 95

2a) 20 **b)** 33 **c)** 96 **d)** 3 **e)** 8 **f)** 2 **g)** 5 **h)** 6 **i)** 11 **j)** 4 **k)** 4 **l)** 7 **m)** 11 **n)** 6

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1a) 49 **b)** 8 **c)** 122 **d)** 105 **e)** 12 **f)** 14 **g)** 177 **h)** 16

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2a) 10 **b)** 34 **c)** 4 **d)** 128 **e)** 4 **f)** 5 **g)** 38 **h)** 8 **i)** 1140 **j)** 283 **k)** 11 **l)** 12 **m)** 21 **n)** 2045

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1a) appropriate steps, **1**
b) appropriate steps, **2**
c) appropriate steps, **3**
d) appropriate steps, 4

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2a) appropriate steps, 1
b) appropriate steps, 6
c) appropriate steps, 2
d) appropriate steps, 5
e) appropriate steps, 4
f) appropriate steps, 1.5
g) appropriate steps, 2.5
h) appropriate steps, 4.25

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3a) appropriate steps, 4
b) appropriate steps, 2
c) appropriate steps, 2
d) appropriate steps, 4