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Pearson Edexcel GCSE (9–1) Mathematics



• Higher • Foundation

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● Year 7 ● Year 8 ● Year 9



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Build in small steps to consolidate knowledge



Focus on **strengthening skills and strategies** through problem-solving



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Pearson Edexcel GCSE (9–1) Mathematics



Purposeful Practice Book

Foundation





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Thought provoking questions that encourage students to articulate a mathematical pattern, structure or relationship.

ResultsPlus

ResultsPlus evidence-informed grades to give insight into how well the cohort achieved nationally at this particular question type.

Students will have the chance to answer exam-style questions related to the skills they have just learnt to help prepare for the GCSE (9–1) exam.

Mixed exercises

solving practice A

- xed problem-solving prectice # Jordan has £10 to spend on chocolate bars. Each chocolate bar costs 64p. Jordan buys ar many chocolate bars as possible. Work out how much money Jordan has left. nsert the missing term to complete the equal $2x \times \Box = 10x^0$
- $2x \times \bigsqcup = 10x^{\circ}$ **3** Work out the value of x when $a^2 \times a^* = a^{\circ}$ **b** Work out the value of y when $(5^{\circ})^{\vee} = 5^{\circ}$
- utes u = 10, a = 4 and t = 5 into the for
- She writes v = 10 + 45 v = 55Explain what Tia has done with
- Explain what is the Side minut-Kamil watts to be Side minut-Each keyring costs 23.80 Kamil does the calculated by 24 = 240 to estimate the cost of 55 keyrings. Kamil does the calculated by 24 = 240 to estimate the cost of 55 keyrings. There is a special offer "Bayr 30 or more keyrings, 142 70% off Werk out the statul cost of Coying 55 keyrings using the special offer.

Mixed exercises

Every 4 units, there will be 4 pages of Mixed exercises, where students can bring topics together to encourage them to make links between the mathematical concepts they have studied previously. This is to ensure that the mathematical concepts are not learnt in isolation.

Sample chapter from Pearson Edexcel GCSE (9–1) Mathematics: **Purposeful Practice Book – Foundation**

2 Algebra

2.1 Algebraic expressions

Key points

- A term is a number, a letter, or a number and a letter multiplied together.
- Like terms contain the same letter to the same power (or do not contain a letter). You can simplify an expression by collecting like terms.
- When multiplying or dividing terms, you can simplify even if they are not like terms.

△ Purposeful practice 1

Copy and complete.

- **1** $5x + 4x = \Box$
- **4** $6x 2x = \square$
- **7** $6b 3b b = \square$
- **10** -3b -b = 2b **11** -b 3b = 2b
- **2** $6x + \Box = 9x$ **5** $6x - \Box = 5x$
- **8** 6b b = 2b
- **3** $8x + \Box = 9x$ **6** $6x - 5x = \square$ **9** -3b + 6b = 2b
- **12** -b + 6b = 2b

Reflect and reason

Sam writes '4n - n = 4'. Explain why Sam is wrong.

When the terms in an expression are reordered, what happens to the signs? Give an example.

A Purposeful practice 2

Simplify by collecting like terms.

1	4y + 3 + 6y	2	4y + 3 + 6	3	4 + 3y + 6 + 2y
4	5t - 7 + 2t	5	5t - 7t + 2	6	5 - 7t + 2t + 3
Sim	plify				
7	$r \times s$	8	$5 \times r \times s$	9	$5 \times r \times s \times 2$
10	$5r \times 2s$	11	$5r \times 2t$	12	$3r \times 2t$
13	$3r \times 4 \times t$	14	$3r \times s \times t$	15	$3r \times 4t \times s$
16	$a \div b$	17	$b \div a$	18	<i>a</i> ÷ 2
19	<i>b</i> ÷2	20	$2 \div a$	21	2 ÷ <i>b</i>

Reflect and reason

Is the simplest form of an expression always only one term? Use your answers to questions on this page to explain.

1 Write and simplify an expression for the perimeter of this triangle.



2 Simplify these expressions. Which one is different to the others?



- **3** Copy and complete with operations + or –. $7x \square 8 \square 2x \square 5 \square 3x = 8x + 3$
- 4 Write an expression for the area of this rectangle in its simplest form.



- **5** The area of this rectangle is 12*b*. What is the length of the rectangle?
- **6** Write three algebraic expressions that simplify to 12x.
- **7** Each row and column in this magic square adds to the same total. Find the missing terms.



Exam practice

- **1 a** Simplify $5 \times 3p$
 - **b** Simplify b 4b + 5b

(2 marks)

7

Adapted from 1MA1/IF, June 2018, Q6

3

Exam feedback

ResultsPlus

In a similar question, both parts were answered well, although part **a** had a greater success rate than part **b**.

These sample pages are from the new Pearson Edexcel GCSE (9–1) Mathematics Purposeful Practice Book – Foundation.

2.2 Simplifying expressions

Key points

- To multiply powers of the same letter, add the indices.
- To divide powers of the same letter, subtract the indices.

\triangle	△ Purposeful practice 1								
Sim	nplify								
1	$x \times x$	2	$x \times x^2$	3	$x \times x^3$	4	$x^2 \times x^3$		
5	$x^4 \times x^3$	6	$x^4 \times x^3 \times x$	7	$x^4 \times x^3 \times x^2$	8	$x \times x^3 \times x^2$		
9	$\frac{n^5}{n^2}$	10	$\frac{n^6}{n^2}$	11	$\frac{n^9}{n^3}$	12	$\frac{n^9}{n}$		
13	$\frac{n^4}{n}$	14	$\frac{n^4}{n^3}$	15	$\frac{n \times n^5}{n^2}$	16	$\frac{n^2 \times n^4}{n^3}$		

Reflect and reason

Kit writes $\frac{n^{10}}{n^2} = n^8$ Lee writes $\frac{n^{10}}{n^2} = n^5$

Who is correct? What has the other person done wrong?

\triangle Purposeful practice 2

Simplify

1	$2u \times 3$	2	$-2u \times 3$	3	$-2u \times -3$	4	$-2u \times 3v$
5	$2u \times -3v$	6	$-3u \times 2v$	7	$2v \times -3v$	8	$5y \times -x$
9	$5y \times x$	10	$5y \times 2x$	11	$-5y \times 2x$	12	$-5y \times -2x$
13	$\frac{2p}{12}$	14	<u>12<i>p</i></u> 2	15	<u>12<i>p</i></u> 4	16	$\frac{12p^2}{4}$
17	$\frac{4p^2}{12}$	18	$\frac{4p^2}{12p}$	19	$\frac{-2t^3}{6}$	20	$\frac{-6t^3}{2}$
21	$\frac{-6t^3}{-2}$	22	$\frac{6t^3}{2t}$	23	$\frac{-6t^3}{2t}$	24	$\frac{-6t^3}{-2t^2}$

Reflect and reason

Is each statement true or false?

Multiplying terms should always lead to a positive answer.

You should write letters in a term in alphabetical order.

Dividing terms should always lead to a whole number answer.

 In this triangle, the terms in circles at the corners multiply to give the term in the rectangle in the middle of each side. Find the missing terms.



- 2 Write two different multiplications that simplify to -15cd.
- **3** Copy and complete by writing in the missing indices.

a
$$t^{2} \times t^{\Box} = t^{5}$$

b $\frac{x^{3}}{x^{\Box}} = x^{2}$
c $\frac{n^{\Box}}{n^{2}} = n^{4}$
d $\frac{r^{3} \times r^{\Box}}{r^{4}} = r^{2}$

- 4 Write and simplify an expression for
 - a the perimeter of this shape
 - **b** the area of this shape

$$r^{4}$$
 x^{3}
 x^{3}

- **5** Write two different divisions that simplify to $4x^3$.
- 6 Copy and complete this multiplication wall. Each term is multiplied by the one beside it, to give the term above.



7 Simplify $\frac{5n+3n}{2}$

Exam practice

- **1** a Simplify $n^4 \times n^2$
 - **b** Simplify $x^2 + x^2$
 - **c** Simplify $2a \times 7c$

Adapted from 1MA1/2F, June 2018, Q20a, 1MA1/2F, June 2017, Q1b and 1MA1/2F, November 2017, Q3a

Exam feedback

ResultsPlus

(1 mark)

(1 mark)

(1 mark)

Q1a: Most students who achieved a Grade 3 or above answered a similar question well.

Q1b: In a similar question, many students gave an answer of x^4 , adding the indices rather than the coefficients.

Q1c: In a similar question, only a minority of students failed to simplify and left a '×' sign in.

2.3 Substitution

Key point

In algebra, 'substitute' means 'replace a letter with a number'.

A Purposeful practice 1

Work out the value of these expressions when m = 5, n = 4 and t = -2

1	m + n	2	m-n	3	n-m	4	m + t
5	n+t	6	n-t	7	t-n	8	m-t

Reflect and reason

Substitute a = -5 into the expression 10 - a. How do you use the 'rules' for subtracting negative numbers?

Purposeful practice 2

Wo	rk out the value of	these	e expressions when	<i>a</i> =	$-1, h = 6 \text{ and } k = \frac{1}{2}$	<u>1</u> 2	
1	3 <i>h</i>	2	3 <i>a</i>	3	-2h	4	-2a
5	2 <i>k</i>	6	-2k	7	4 <i>k</i>	8	3 <i>k</i>
9	ah	10	hk	11	ak	12	-ak
13	-2 <i>hk</i>	14	-3 <i>a</i> h	15	ahk	16	–2ahk

Reflect and reason

What is the 'missing sign' between *a* and *h* in *ah*?

A Purposeful practice 3

Work out the value of these expressions when b = 2, c = -4 and f = 10

1	b+2f	2	b + 2c	3	b-2c	4	f-2c	
5	bf-1	6	<i>bc</i> + 8	7	bf-c	8	$\frac{b}{2}$	
9	$\frac{c}{2}$	10	$\frac{f}{b}$	11	$\frac{3c}{2}$	12	$\frac{-3c}{2}$	
13	b^2	14	C^2	15	$-c^2$	16	$b^2 + c^2$	
17	$b^2 + f$	18	$c^{2} + 2f$	19	$3b - c^2$	20	$\frac{c^2}{4}$	
21	$\frac{c^2}{c}$	22	$\frac{f^2}{b^2}$	23	$\frac{b^2}{f}$	24	$\frac{c^2}{f}$	
Ref	Reflect and reason							
After	After substituting, in what order did you complete each calculation?							

- **1 a** Find two positive values for *m* and *n* so that m + n = 7
 - **b** Find one positive and one negative value for *m* and *n* so that m + n = 7
- **2** Alex substitutes s = 8 and $t = \frac{1}{2}$ into the expression *st*.

Alex says the answer is $8\frac{1}{2}$

What mistake has Alex made?

- **3** Kim says, '*mhg*, *ghm* and *hmg* always have the same value, for any values of *m*, *h* and *g*'. Choose some numbers to show that Kim is correct. Explain why.
- 4 Find the value of 2n 1 when n = 1, n = 2, n = 3, n = 4 and n = 5. Write your answers in order as a number sequence. What is this sequence of numbers usually called?
- **5 a** Work out the value of 4q 3 when q = 6.
 - **b** M = 3t 2st = 4 and s = -5Work out the value of M.
- **6** Dilip says that $x^2 \ge 0$ for every possible value of *x*. Is Dilip correct? Explain.
- 7 Find a value of x so that $x^2 = 2x$.
- 8 Find a pair of values for p and q so that 6+2p=q-2

🔅 Exam practice

1 a = 4b = 3

Work out the value of 5a - 2b

(2 marks)

Adapted from 1MA1/1F, Specimen papers, Set 2, Q10

2 C = 5a + 3ba = 6b = -1

Work out the value of C.

(2 marks)

ResultsPlus

Adapted from 1MA1/1F, May 2018, Q16a

Exam feedback

Q2: Most students who achieved a Grade 3 or above answered a similar question well.

2.4 Formulae

Key point

A formula is a general rule that shows a relationship between variables.

Purposeful practice 1

Find the missing numbers and terms.

- 1 1 bag costs 10 pence 2 bags cost ____ pence 3 bags cost ____ pence n bags cost ____ pence Formula for cost of *n* bags is $C = __$ pence **2** 1 pen costs *b* pence 2 pens cost ____ pence
- - 3 pens cost ____ pence
 - m pens cost ____ pence

Formula for cost of *m* pens is $C = __$ pence

Reflect and reason

How does using numbers to create a pattern help you to find a formula?

🛆 Purposeful practice 2

- 1 Write a formula beginning C =____ for the total cost of
 - **a** *p* items at £5 each
 - **b** *n* items at £5 each
 - **c** 4 items at £*t* each
 - **d** *m* items at £*t* each
 - e *m* items at £*t* each plus £4 postage and packing
 - f *m* items at $\pounds t$ each plus $\pounds r$ postage and packing

2 There are *y* nuts in a box.

Write a formula beginning N =____ for the total number of nuts in

- a 1 box
- **b** 1 box when 20 nuts are taken out
- c x boxes
- **d** x boxes and 30 extra nuts
- e x boxes with 5 nuts taken out of each box

Reflect and reason

Which words in a problem tell you the formula will include these signs?

+ × ÷

1 Match each formula to a description.

C = 3n	the cost of n items at £10 each
<i>C</i> = 10 <i>n</i>	the cost of n items at £10 each plus £3 delivery charge
C = 3n + 10	the cost of n items at £3 each
<i>C</i> = 10 <i>n</i> + 3	the cost of n items at £3 each plus £10 delivery charge

2 The formulae for the lengths of 3 pieces of rope, in terms of g, are

length of rope A = 7 + glength of rope B = g - 2length of rope C = g + 5

- a Which rope is the longest?
- **b** Which rope is the shortest?
- **3** The formula P = 4x + y is used to work out the cost of 4 cakes and 1 box.
 - a Which letter represents the price of a cake?
 - **b** Which letter represents the price of a box?
 - **c** The formula for the cost of Parmit's cakes is P = 9x + 2y. How many cakes did Parmit buy?
- 4 The formula C = 150n + 400 is used to work out a cost in pence. Rewrite the formula to work out a cost in pounds (£).

🚸 Exam practice

 Here are four sections of toy train track. All measurements are in cm. The total length of the four sections is L cm. Find a formula for L in terms of x. Write your formula as simply as possible.



(3 marks)

Adapted from 1MA1/1F, November 2017, Q6

Exam feedback

ResultsPlus

In a similar question, many students identified the correct methods to form an expression or write an equation for L. Many understood the need to add all terms to form an expression but were unable to gain full marks due to poor algebraic manipulation skills.

2.5 Expanding brackets

Key point

• 'Expanding' single brackets means 'multiply each term inside the brackets by the term outside'.

$$5(x-6) = 5x - 30$$

	Purposeful practice 1								
Exp	band								
1	3(<i>x</i> + 1)	2	3(<i>x</i> + 2)	3	3(<i>x</i> + 10)				
4	3(x-1)	5	3(x-2)	6	3(x-5)				
Ref Karr Exp	Reflect and reason Kamal expands $5(x + 2)$ to give $5x + 2$. Explain what Kamal has done wrong.								
Ĺ	Purposeful practice 2								
Exp	band								
1	2(<i>m</i> + 1)	2	2(<i>m</i> – 1)	3	-2(<i>m</i> + 1)				
4	-2(<i>m</i> - 1)	5	-1(<i>m</i> + 7)	6	-1(<i>m</i> - 7)				
7	-(<i>m</i> + 7)	8	-(<i>m</i> - 7)	9	-(- <i>m</i> + 7)				
Reflect and reason Are the signs always the same in the expanded and factorised expression? Why?									
Δ	Purposeful practice 3								
Exp	band								
1	4(<i>n</i> + 3)	2	4(3 + <i>n</i>)	3	-5(3 + <i>n</i>)				
4	-5(<i>n</i> + 3)	5	-5(<i>n</i> - 3)	6	3(<i>r</i> – 6)				

13 t(t + 3)**16** k(k + 1)

7 3(r+6)

19 2k(k+4)

10 -3(2r+6)

Reflect and reason

Is 2(5y + 3) equivalent to 2(3 + 5y)? Show working to explain.

Is 2(4x - 1) equivalent to 2(1 - 4x)? Show working to explain.

8 3(2r+6)

11 -3(2r-6)

14 t(2t+3)

17 2k(k+1)

20 2k(k-4)

9 3(4r+6)

12 -3(6+2r)

15 t(2t-3)

18 2k(k-1)

21 -2k(k-4)

- 1 Copy and complete.
 - **a** $2(a + \Box) = 2a + 8$
 - **b** \Box (*y* 7) = \Box 14
 - **c** $(n + []) = n^2 + 5n$
 - $d -3(\Box + c) = -9 \Box$
 - **e** $(6t) = 6t^2 2t$
 - **f** $5p(\Box 3) = 5p^2 \Box$
- 2 Here is Simon's homework.

$$4(3d - 2) = 12d - 8$$

= 4d

What mistake has Simon made?

- **3** Erin says 'When you expand brackets with two terms inside, you get two terms in your answer.' Write two examples to show that Erin is correct.
- 4 In this rhombus, the two expressions in circles at the corners multiply to give the expression in a rectangle in the middle of each side. Find the missing expressions.



5 Expand and simplify

- **a** 5(x+3)+2
- **b** 4(5+n) n

Exam practice

1	а	Expand $2c(c+5)$
---	---	------------------

- **b** Expand 4d(2-d)
- **c** Expand and simplify 2(x-3) + 3(4x+1)

Adapted from 1MA1/1F, May 2018, Q16b and 1MA1/3F, June 2018, Q20

Exam feedback	ResultsPlus
Q1a: Most students who achieved a Grade 4 or above answered a similar question	well.
Q1b: Most students who achieved a Grade 4 or above answered a similar question	well.
Q1c: Most students who achieved a Grade 5 answered a similar question well.	

These sample pages are from the new Pearson Edexcel GCSE (9–1) Mathematics Purposeful Practice Book – Foundation.

(2 marks)

(2 marks)

(2 marks)

2.6 Factorising

Key points

- The factors of a term are all the numbers and letters that divide exactly into it.
- A common factor is a factor of two or more terms.

Factorise

$$3m + 12 = 3(m + 4)$$

Expand highest c

highest common factor of 3 and 12

\triangle Purposeful practice 1

Copy and complete.

1 $2x + 6 = 2(\Box + \Box)$	2 $2x + 4 = 2(\Box + \Box)$	3 $2x + 2 = 2(\Box + \Box)$
Factorise. Check your answ	vers by expanding the brackets.	
	F 0 0	• • •

-	$2\lambda = 10$	J	$Z_{\mathcal{A}}=0$	U	$Z_{\mathcal{A}} - Z$
7	3 <i>y</i> + 3	8	3 <i>y</i> + 6	9	3 <i>y</i> – 6

Reflect and reason

Shay factorises 2x - 4 to give 2(x - 4). Explain the mistake Shay has made.

A Purposeful practice 2

Fac	torise						
1	4 <i>a</i> + 8	2	4 <i>a</i> – 12	3	6 <i>a</i> + 12	4	6 <i>a</i> – 24
5	12 <i>t</i> – 18	6	12 <i>t</i> + 20	7	12 <i>t</i> + 6	8	12 <i>t</i> – 9
9	21 <i>t</i> – 9	10	21 <i>t</i> + 35	11	20 <i>m</i> + 35	12	20 <i>m</i> – 40
13	$m^2 + m$	14	$m^2 + 2m$	15	$m^2 - 3m$	16	$5m + m^2$
17	$4m - m^2$	18	$2m^2 - m$	19	$m^2 - 2m$	20	$3m^2 + m$
21	$m^2 + 3m$	22	$2b^2 + 2b$	23	$2b^2 + 4b$	24	$2b^2 - 6b$
25	$b^2 + bg$	26	$b^2 - bg$	27	$3b^2 - bg$	28	$3b^2 - 6bg$
29	$3b^2 + 9bg$	30	$3b^2 - 3bg$	31	$6b^2 + 9bg$	32	$6b^2 + 12bg$

Reflect and reason

Can a factor be a letter a number a number and a letter? Find examples from this page to explain.

1 Match each expanded expression with its factorised form.

n^2-n	n(n-2)
$2n - n^2$	<i>n</i> (2 <i>n</i> – 1)
$n-2n^2$	<i>n</i> (<i>n</i> – 1)
$n^2 - 2n$	2n(n-1)
$-n^2 + 2n$	n(1-2n)
$2n^2-n$	<i>n</i> (2 – <i>n</i>)
$2n^2 - 2n$	n(-n+2)

- 2 Copy and complete.
 - **a** $\Box 24 = 3(x \Box)$
 - **b** $20x + \Box = 5(\Box + 3)$
 - **c** $x^2 2x = \Box (x \Box)$
 - **d** $4x^2 + \Box = 2x(\Box + 3)$
 - $e \quad 3x^2 \Box = x(\Box a)$
- 3 Here is Mo's answer to a test question

Question	Mo's answer		
Factorise $3y + 15$	18y		

- a Explain what Mo has done wrong.
- **b** Factorise 3y + 15
- **4** Tia says 'When you factorise an expression with two terms, you get two terms inside the brackets in your answer.'

Write two examples to show that Tia is correct.

- **5 a** Expand 6(*x* 3)
 - **b** Factorise 6x 3
 - **c** Simplify 6x 3 + x + 2
- 6 Factorise completely
 - **a** 4*x* + 36
 - **b** $12n^2 + 3n$

Exam practice

- **1 a** Factorise 4*n* 12
 - **b** Factorise $x^2 + x$

Adapted from 1MA1/2F, June 2017, Q14a and 1MA1/1F, Specimen papers, Set 2, Q19a

Exam feedback	Results Plus
Q1a: Most students who achieved a Grade 5 answered a similar question well.	

(1 mark)

(1 mark)

These sample pages are from the new Pearson Edexcel GCSE (9–1) Mathematics Purposeful Practice Book – Foundation.

2.7 Using expressions and formulae

Key point

• To use an expression or formula, substitute the values you are given.

🛆 Purposeful practice 1

Substitute the values x = 2 and y = 6 in to each formula.

1	T = x + y	2	R = x - y	3	S = -x + y
4	V = -x - y	5	L = 5x	6	B = 4y
7	$C = \frac{1}{2}y$	8	M = xy	9	K = -xy
10	$P = \frac{x}{y}$	11	$N = \frac{y}{x}$	12	$Z = \frac{-y}{x}$
13	$D = \frac{-y}{-x}$	14	$F = \frac{-x}{-y}$	15	$H = \frac{x}{-y}$

Reflect and reason

F = ma is a formula used in science.

Which of these is the correct way to calculate *F* when m = 7 and a = 2?

Α	F = <i>ma</i>	В	F = <i>ma</i>	C	F = ma
	F = 72		$F = 7 \times 2$		$F = 7^{2}$
			F = 14		F = 49

Very Purposeful practice 2

Substitute the values t = 8, v = -3 and n = 4 in to each formula.

1	A = t + 3	2	B = t + v	3	C = v + 3	4	D = 2t + v
5	$D = t^2 + v$	6	E = 2t - 3v	7	F = nt - 1	8	G = nt + v
9	H = nt + 2v	10	J = 2n	11	$J = n^2$	12	$K = n^2 - 5$
13	$L = n^2 + t$	14	$M = n^2 + 2t$	15	$P = v + n^2$	16	$Q = tv + n^2$
17	$R = \frac{t}{n} + 7$	18	$S = \frac{t}{n} + v$	19	$W = \frac{n}{t} + v$	20	$X = \frac{n}{t} - v$

Reflect and reason

The same letters and numbers are used in **Q4** and **Q5**, and then in **Q10** and **Q11**. Why don't you get the same answers when you substitute?

1 Here are Ash's and Charlie's answers to a test question.

Question	Ash's answer	Charlie's answer
d = st Work out the value of d when $s = 20$ $t = \frac{1}{2}$	$d = 20 \times \frac{1}{2}$ $d = 10$	$d = 20\frac{1}{2}$

Whose answer is wrong? Explain why it is wrong.

- 2 Write a formula starting $k = _$ Use the letters *a* and/or *n* and any operations or numbers, so that k = 8 when a = 6 and n = 3.
- **3** Which formula does not give the same value of T when x = -3, y = 2 and z = 6?

A
$$T = xy - z$$
 B $T = \frac{z}{y} + 5x$ **C** $T = x^2 - \frac{z}{y}$ **D** $T = zx + 3y$

4 The formula for speed is $s = \frac{d}{t}$

where *s* is speed, *d* is distance and *t* is time. Calculate the speed in metres per second when a car travels a distance of 400 m in 25 seconds.

- **5** Use the formula v = u + at to work out
 - **a** *v* when u = 0, a = 9.8 and t = 6
 - **b** *v* when u = 4, a = -5 and t = 0.2

Exam practice

1 a
$$X = 3y + 1$$

Work out the value of X when y = 5

b
$$m = n + ch$$

Work out the value of *m* when

$$n = 7$$
 $c = -4$ $h = \frac{1}{2}$

Adapted from 1MA1/3F, June 2017, Q11a and 1MA1/1F, May 2017, Q16

2 $p = s + \frac{r}{2}$

Work out the value of p when s = -7 r = -10

Exam feedback

Q1a: Most students who achieved a **Grade 3** or above answered a similar question well. **Q1b**: In a similar question, many students missed out the ' \times ' when substituting into *ch*.

These sample pages are from the new Pearson Edexcel GCSE (9–1) Mathematics Purposeful Practice Book – Foundation.

(2 marks)

(2 marks)

sults Plus

Mixed exercises



- There is a special offer 'Buy 50 or more key rings, get 20% off'
- b Work out the actual cost of buying 55 key rings using the special offer.
- **6** James is asked to fully factorise $8x^2 + 4x$ He writes
 - 2x(4x+2)

Explain why James hasn't fully factorised $8x^2 + 4x$

7 The table shows the maths and science test results of 14 students.

Maths	8	10	12	15	15	20	21	21	23	25	28	30	34	28
Science	12	8	16	13	20	24	22	28	30	28	40	33	40	47

- **a** Draw a scatter graph for the data.
- Write the type of correlation.
 Sophie scored 28 on the maths test but was absent for the science test.
- c Estimate a science mark for Sophie.
 A teacher says,
 'Students who score higher marks in science tests are those who score higher marks in maths tests.'
- **d** Does the scatter graph support what the teacher says? Give a reason for your answer.

- 8 Taylor's age is a square number. Callum's age is a cube number. Callum is 1 year younger than Taylor. How old are Taylor and Callum?
- **9** Use the formula A = bh to work out A when b = 5.5 and h = 6
- **10** Sarah takes $\frac{3}{5}$ of a cake to work.

Ali eats $\frac{1}{6}$ of the cake Sarah takes. What fraction of the whole cake did Ali eat?

11 The table shows information about the average daily hours of sunshine in two Australian cites over five months.

	January	February	March	April	Мау
Darwin	7	7	8	9	9
Sydney	9	8	8	8	7

Ava wants to compare this information.

- **a** Show this information in a suitable diagram.
- **b** Compare the number of hours of sunshine in Darwin and Sydney. Write down two comparisons.
- **12** Complete $\Box(\Box 5) = 3y 15$
- **13** Emily, Finn and Tomas sat a science test. The total score for the test was 80 marks. Emily got 38 out of 80. Finn got 45% of the 80 marks. Tomas got $\frac{3}{10}$ of the 80 marks. Who achieved the highest score? Show your working to explain your answer.
- Sonu buys some crisps and juice. There are 40 bags of crisps in a box. There are 12 cartons of juice in a box. Sonu buys exactly the same number of bags of crisps and cartons of juice. How many boxes of bags of crisps and boxes of juice does she buy?
- 15 The pie chart shows information about the type of transport students use to get to college.



- **a** What fraction of the students walk to college?
- **b** 450 students travel by car. What is the total number of students at the college?

These sample pages are from the new Pearson Edexcel GCSE (9–1) Mathematics Purposeful Practice Book – Foundation.

Exam practice

16 Write down the first even multiple of 9

(1 mark)

ResultsPlus

Adapted from 1MA1/1F, May 2018, Q5

Exam feedback

Most students who achieved a Grade 5 answered a similar question well.

Exam practice

17 Here are four straight lines.



All measurements are in centimetres. The total length of the four lines is L cm. Write a formula for L in terms of x. Write your formula as simply as possible.

(3 marks)

Total

ResultsPlus

ResultsPlus

Female

Adapted from 1MA1/1F, November 2017, Q6

Male

Exam feedback

In a similar question, some student's solutions showed incomplete simplification or gave an incorrect simplification when beginning to write an expression.

Exam practice

18 There are 90 students in Jack's year group. 50 of the students are male.

Exam feedback

In a similar question, most students were comfortable with two-way tables but a small minority did reverse the entries so careful reading of the headings is required.

50 of the students are male. No glasses 6 of the female students wear glasses. Total 7 of the students who wear glasses are male. Total Use the information to complete the two-way table. (3 marks) Adapted from 1MA1/1F, November 2017, Q12

Glasses

22 These sample pages are from the new Pearson Edexcel GCSE (9–1) Mathematics Purposeful Practice Book – Foundation.

Exam practice

19 Here are two fractions

 $\frac{5}{9}$ $\frac{9}{5}$

Work out which of the fractions is closer to 1 You must show all your working.

(3 marks)

Adapted from 1MA1/1F, November 2017, Q14

Exam feedback

ResultsPlus

In a similar question, students often secured some marks, but very few scored full marks as they were unable to follow through their approach to the correct final answer.

Exam practice

 Helen is paid £1800 per month. She is going to get a 2% increase in the amount of money she is paid. Work out how much money Helen will be paid per month after the increase. (2 marks) Adapted from 1MA1/1F, May 2017, Q20

ResultsPlus Exam feedback Most students who achieved a Grade 4 answered a similar question well. Exam practice 21 A force of 90 newtons acts on an area of 30 cm² pressure = $\frac{\text{force}}{\text{area}}$ The force is increased by 20 newtons, N. The area is increased by 20 cm² Claire says, 'The pressure decreases by less than 25%' Is Claire correct? You must show how you get your answer. (3 marks) Adapted from 1MA1/2F, June 2018, Q25 ultsPlus Exam feedback Most students who achieved a Grade 5 answered a similar question well.

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