

Pearson Edexcel
**International GCSE
Mathematics**

Enhancing Teaching through
Mastering Marking



The image features a solid yellow background. A white rectangular area is positioned in the upper-left quadrant. A thin, dark blue vertical line is located to the left of the white rectangle, extending from its top edge down to its bottom edge.

Joe Skrakowski

Agenda

Time	Session
09:00	Welcome & Introductions
09:30	Writing assessment materials
10:30	Refreshment break
11:00	Marking International GCSE papers
13:00	Lunch
13:45	Marking International GCSE papers continued
14:45	Support from Pearson
15:00	Finish

Aims and Objectives

- be introduced to the process of producing assessment materials
- be introduced to the process of marking candidates' work
- Look at examiner recruitment and training
- be introduced to the codes used in mark schemes
- look at Examiner Reports to see where centres should concentrate their attention to improve outcomes.
- look at how a GCSE question is marked in detail.
- practice marking International GCSE questions [4MA1] – Short response, medium response, extended response, 'show that' questions
- Network, discuss best practice and share ideas with other teachers.



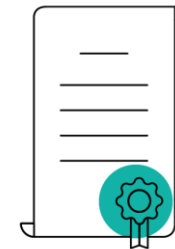
Welcome to Pearson

Welcome to Pearson Edexcel

- We are the world's leading learning company and as the **UK's largest awarding organisation**, best placed to provide qualifications aligned to the British educational system.
- Our international **heritage stretches back over 150 years**.
- Today, we partner with schools, universities and employers worldwide, offering world-class, globally-recognised qualifications to over **3.5 million students a year**.



Trusted and recognized qualifications partner to **6,500** schools, colleges and employers globally



We mark over **10 million** exam scripts on behalf of the UK Department for Education each year



We operate in **70** countries worldwide

The benefits of partnering with Pearson Edexcel

We lead the way in digital teaching, learning and assessment

- Online schooling expertise spanning 20+ years.
- Onscreen assessment capabilities.
- 25,000 educators accessed our digital learning resources in 2020.

Our globally recognised modular qualifications protect learners in times of uncertainty

- Bank ongoing evidence of performance.
- Multiple exam opportunities throughout the year.
- Proven university progression.
- Comparability with GCE AS/A Level.

We are more than an awarding organisation

- Career-based BTEC qualifications.
- English language learning resources and testing.
- Learner research and professional developments.

Progression and recognition



Global recognition

Pearson Edexcel International GCSE and International A level qualifications are most closely aligned to the British education system and are accepted for entry to undergraduate programmes by more than 650 leading universities worldwide.



Seamless progression

Pearson Edexcel International GCSE qualifications are excellent preparation for International A levels.

All higher education institutions that recognise UK GCE A Levels also recognise Pearson Edexcel International A levels.

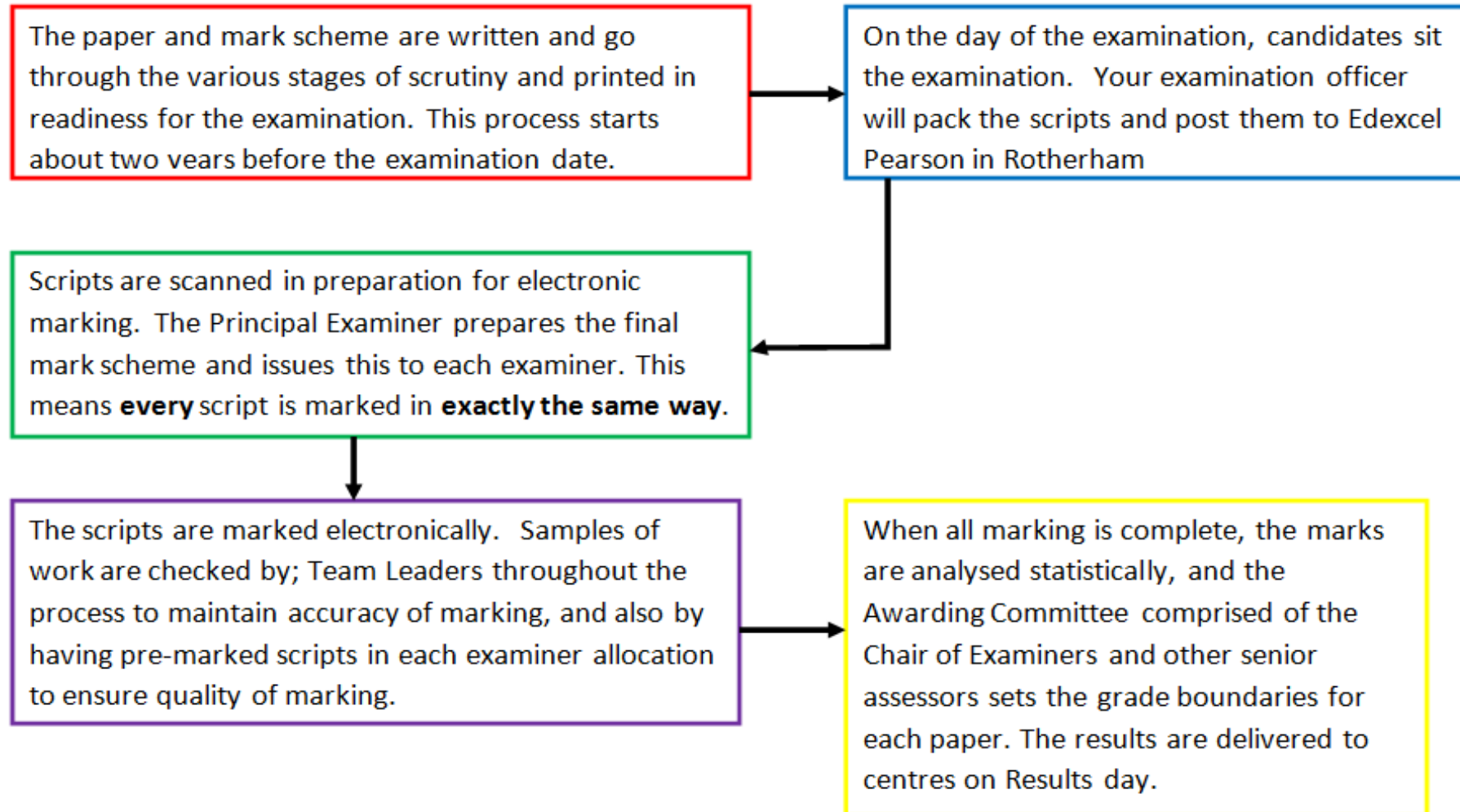


Future career success

With our globally recognised Pearson Edexcel International qualifications, you can be sure that you are preparing your students in the best way possible for their future career success with the qualifications, skills and knowledge that admissions teams and employers are looking for.

Introduction to writing papers

The flowchart of the assessment process.

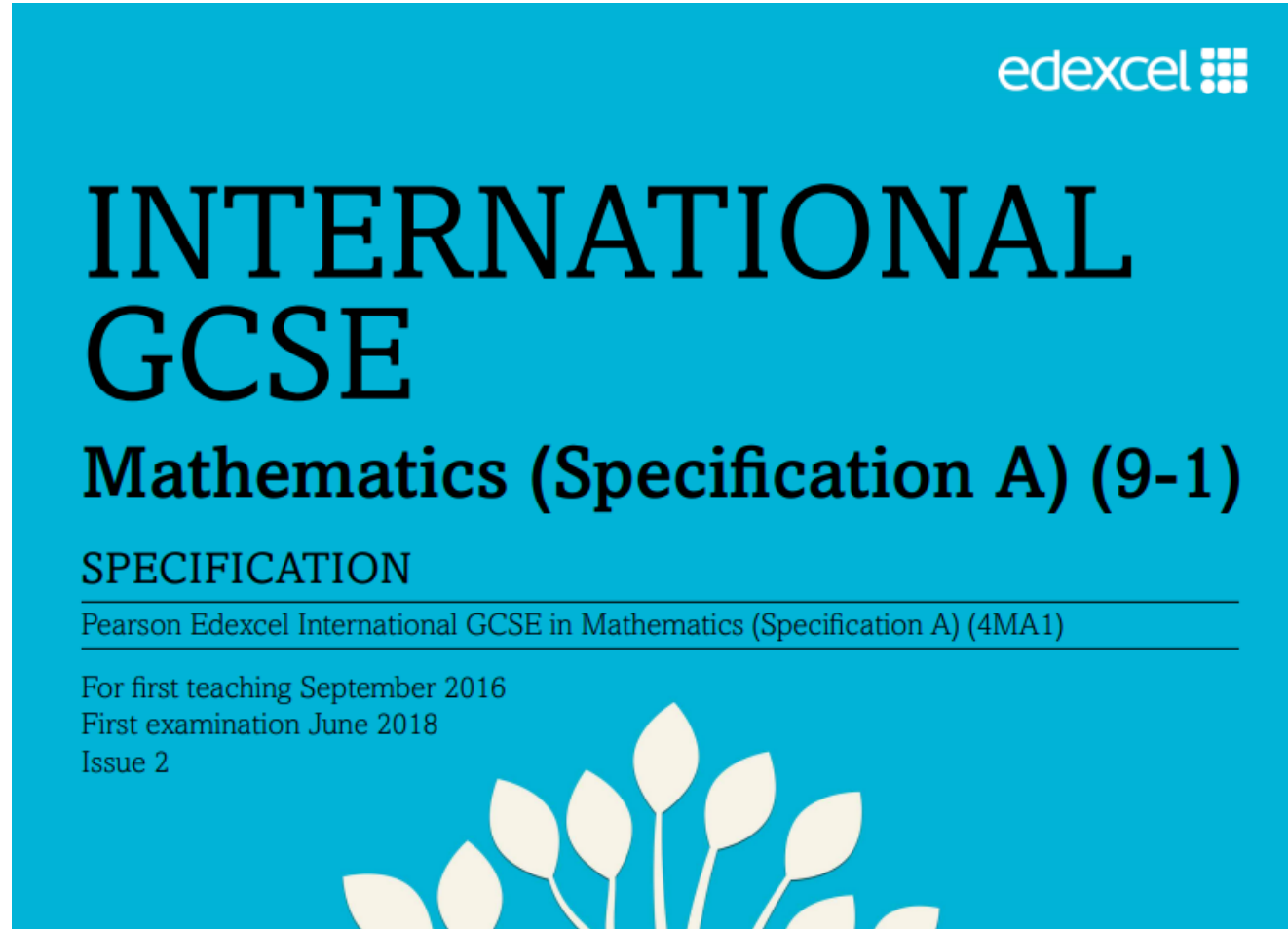




Writing a paper – stage 1

- The Principal Examiner/Writer is issued a contract approximately two years in advance.
- Key documents the Principal Examiner will use:
 1. The Specification
 2. The Sample Assessment Materials

The Specification



Contents

Contents

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Sample of content

This is the content that will be tested and that must be taught.

3 Sequences, functions and graphs

	Students should be taught to:	Notes
3.1 Sequences	A understand and use common difference (d) and first term (a) in an arithmetic sequence	e.g. given 2nd term is 7 and 5th term is 19, find a and d
	B know and use n th term $= a + (n-1)d$	
	C find the sum of the first n terms of an arithmetic series (S_n)	e.g. given $4 + 7 + 10 + 13 + \dots$ find sum of first 50 terms
3.2 Function notation	A understand the concept that a function is a mapping between elements of two sets	
	B use function notations of the form $f(x) = \dots$ and $f: x \mapsto \dots$	
	C understand the terms 'domain' and 'range' and which values may need to be excluded from a domain	$f(x) = \frac{1}{x-2}$ exclude $x = 2$
	D understand and find the composite function fg and the inverse function f^{-1}	'fg' will mean 'do g first, then f'
3.3 Graphs	A recognise, plot and draw graphs with equation: $y = Ax^3 + Bx^2 + Cx + D$ in which: (i) the constants are integers and some could be zero (ii) the letters x and y can be replaced with any other two letters or: $y = Ax^3 + Bx^2 + Cx + D + \frac{E}{x} + \frac{F}{x^2}$ in which: (i) the constants are numerical and at least three of them are zero (ii) the letters x and y can be replaced with any other two letters or: $y = \sin x, y = \cos x, y = \tan x$ for angles of any size (in degrees)	$y = x^3$ $y = 3x^3 - 2x^2 + 5x - 4$ $y = 2x^3 - 6x + 2$ $V = 60w(60 - w)$ $y = \frac{1}{x}, x \neq 0,$ $y = 2x^2 + 3x + \frac{1}{x},$ $x \neq 0,$ $y = \frac{1}{x}(3x^2 - 5),$ $x \neq 0,$ $w = \frac{5}{d^2}, d \neq 0$

Examples clarifying the content.

Assessment Objectives

Assessment objectives and weightings

		% in International GCSE
AO1	Demonstrate knowledge, understanding and skills in number and algebra: <ul style="list-style-type: none"> • numbers and the numbering system • calculations • solving numerical problems • equations, formulae and identities • sequences, functions and graphs. 	57–63%
AO2	Demonstrate knowledge, understanding and skills in shape, space and measures: <ul style="list-style-type: none"> • geometry and trigonometry • vectors and transformation geometry. 	22–28%
AO3	Demonstrate knowledge, understanding and skills in handling data: <ul style="list-style-type: none"> • statistics • probability. 	12–18%
TOTAL		100%

Relationship of assessment objectives to units

Unit number	Assessment objective		
	AO1	AO2	AO3
Papers 1F and 2F	28.5–31.5%	11–14%	6–9%
Papers 1H and 2H	28.5–31.5%	11–14%	6–9%
Total for International GCSE	57–63%	22–28%	12–18%

All components will be available for assessment from June 2018.

Relationship of problem-solving and mathematical reasoning skills to tier.

	Problem solving	Mathematical reasoning
Foundation (1F and 2F)	25%	15%
Higher (1H and 2H)	30%	20%

Calculators

Calculators

Students will be expected to have access to a suitable electronic calculator for all examination papers.

Foundation Tier

The electronic calculator to be used by students attempting Foundation Tier examination papers (1F and 2F) should have these functions as a minimum:

- $+$, $-$, \times , \div , x^2 , \sqrt{x} , memory, brackets, x^y , $x^{\frac{1}{y}}$, \bar{x} , $\sum x$, $\sum fx$, sine, cosine, tangent and their inverses

Higher Tier

The electronic calculator to be used by students attempting Higher Tier examination papers (1H and 2H) should have these functions as a minimum:

- $+$, $-$, \times , \div , x^2 , \sqrt{x} , memory, brackets, x^y , $x^{\frac{1}{y}}$, \bar{x} , $\sum x$, $\sum fx$, standard form, sine, cosine, tangent and their inverses

Prohibitions

Calculators with any of the following facilities are prohibited in all examinations:

- databanks
- retrieval of text or formulae
- QWERTY keyboards
- built-in symbolic algebra manipulations
- symbolic differentiation or integration.

Assessment information

Assessment requirements

Paper number	Level	Assessment information	Number of marks allocated in the paper
Paper 1F	Foundation	Assessed through a 2-hour examination set and marked by Pearson. The paper is weighted at 50% of the qualification, targeted at grades 5–1.	100
Paper 2F	Foundation	Assessed through a 2-hour examination set and marked by Pearson. The paper is weighted at 50% of the qualification, targeted at grades 5–1.	100
Paper 1H	Higher	Assessed through a 2-hour examination set and marked by Pearson. The paper is weighted at 50% of the qualification, targeted at grades 9–4 with 3 allowed.	100
Paper 2H	Higher	Assessed through a 2-hour examination set and marked by Pearson. The paper is weighted at 50% of the qualification, targeted at grades 9–4 with 3 allowed.	100



Sample assessment materials

Sample papers and mark schemes can be found in the *Pearson Edexcel International GCSE in Mathematics Sample Assessment Materials (SAMs)* document.

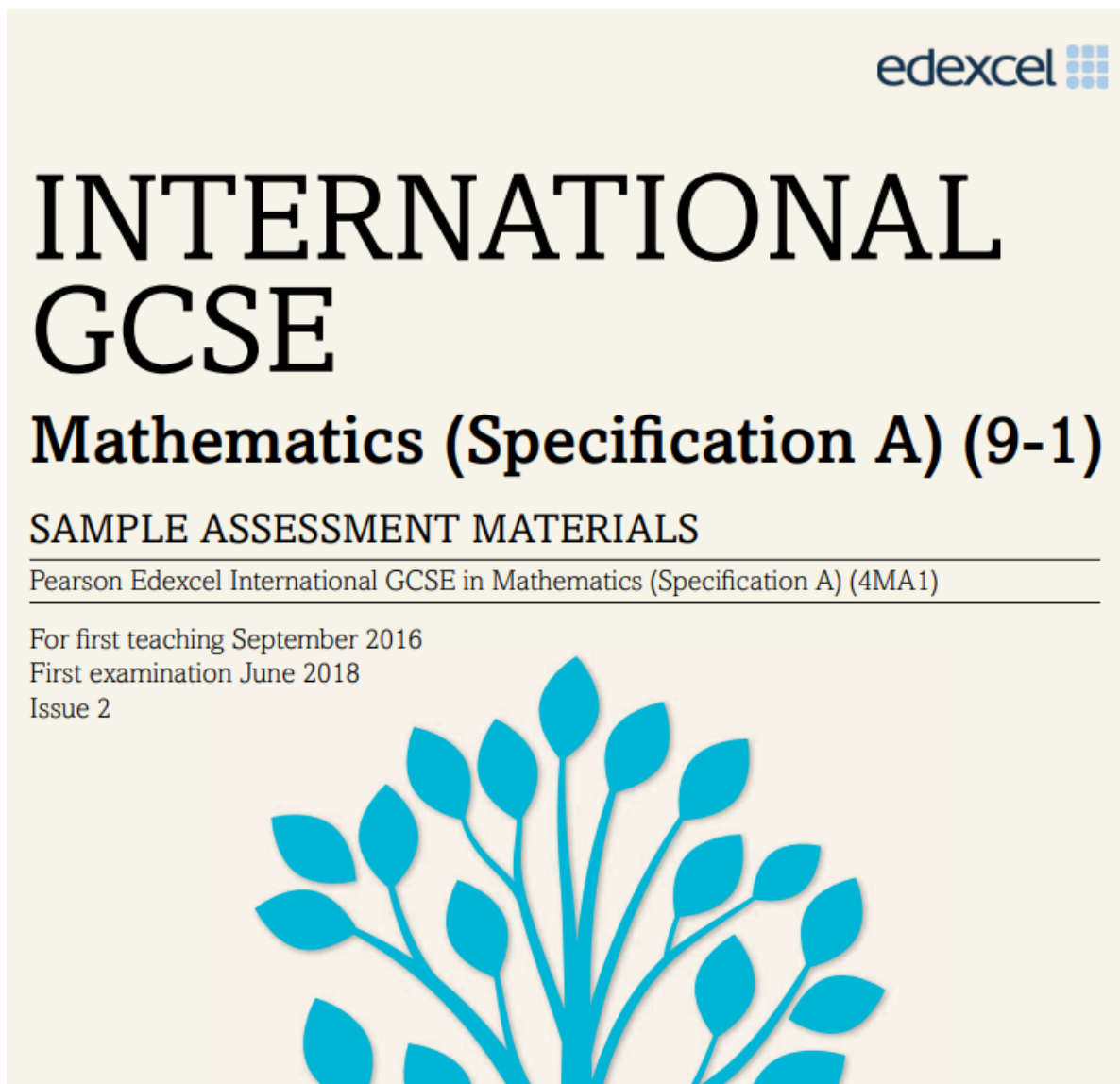
Notation we can use in the examination

Appendix 6: Notation

Notation used in the examination include the following:

$\{ \quad \}$	the set of
$n(A)$	the number of elements in the set A
$\{ x : \}$	the set of all x such that
\in	is an element of
\notin	is not an element of
\emptyset	the empty (null) set
\mathcal{U}	the universal set
\cup	union
\cap	intersection
\subset	is a subset of
A'	the complement of the set A
PQ	operation Q followed by P
$f: A \rightarrow B$	is a function under which each element of set A has an image in set B
$f: x \mapsto y$	f is a function under which x is mapped to y
$f(x)$	the image of x under the function f
f^{-1}	the inverse relation of the function f
fg	the function g followed by function f , i.e. $f(g(x))$
	open interval on the number line
	closed interval on the number line
\mathbf{a}	the vector \mathbf{a}
\overrightarrow{AB}	the vector represented in magnitude and direction by \overrightarrow{AB} the vector from point A to point B
$ \mathbf{a} $	the magnitude of vector \mathbf{a}

From the
website



The paper front page

Write your name here

Surname	Other names
---------	-------------

Pearson Edexcel International GCSE

Centre Number	Candidate Number
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Mathematics A

Level 1/2

Paper 1F

Foundation Tier

Sample assessment material for first teaching September 2016

Time: 2 hours

Paper Reference
4MA1/1F

You must have:
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Without sufficient working, correct answers may be awarded no marks.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- **Calculators may be used.**
- You must **NOT** write anything on the formulae page.
Anything you write on the formulae page will gain NO credit.

Information

- The total mark for this paper is 100.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Check your answers if you have time at the end.

Note this very important information. Your students should be familiar with this BEFORE the exam; they will not have time to read it when the exam starts!

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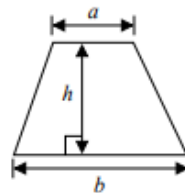
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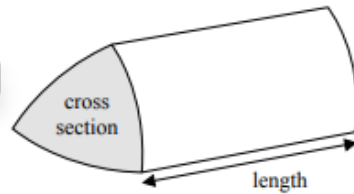
Formulae pages

International GCSE Mathematics Formulae sheet – Foundation Tier

Area of trapezium = $\frac{1}{2}(a + b)h$

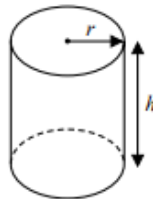


Volume of prism = area of cross section \times length



Volume of cylinder = $\pi r^2 h$

Curved surface area of cylinder = $2\pi r h$



International GCSE Mathematics Formulae sheet – Higher Tier

Arithmetic series

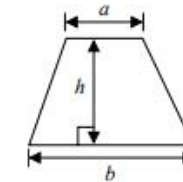
Sum to n terms, $S_n = \frac{n}{2} [2a + (n - 1)d]$

The quadratic equation

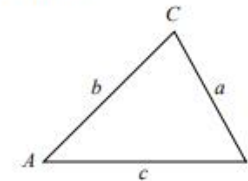
The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$ are given by:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Area of trapezium = $\frac{1}{2}(a + b)h$



Trigonometry



In any triangle ABC

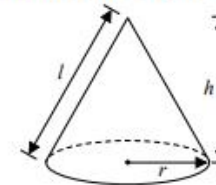
Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc \cos A$

Area of triangle = $\frac{1}{2}ab \sin C$

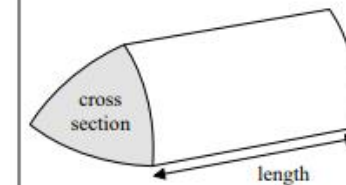
Volume of cone = $\frac{1}{3}\pi r^2 h$

Curved surface area of cone = $\pi r l$



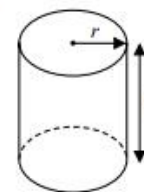
Volume of prism

= area of cross section \times length



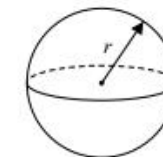
Volume of cylinder = $\pi r^2 h$

Curved surface area of cylinder = $2\pi r h$



Volume of sphere = $\frac{4}{3}\pi r^3$

Surface area of sphere = $4\pi r^2$



Sample Assessment materials

Sample pages

Answer ALL TWENTY THREE questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

- 1 Yoko flew on a plane from Tokyo to Sydney.
The plane flew a distance of 7800 km.
The flight time was 9 hours 45 minutes.

Work out the average speed of the plane in kilometres per hour.

Total marks

..... km/h

(Total for Question 1 is 3 marks)

- 2 Penny, Amjit and James share some money in the ratios 3:6:4
Amjit gets \$28 more than James.

Work out the amount of money that Penny gets.

\$

(Total for Question 2 is 3 marks)

- 3 A factory has 60 workers.

The table shows information about the distances, in km, the workers travel to the factory each day.

Distance (d km)	Frequency
$0 < d \leq 5$	12
$5 < d \leq 10$	6
$10 < d \leq 15$	4
$15 < d \leq 20$	6
$20 < d \leq 25$	14
$25 < d \leq 30$	18

- (a) Write down the modal class.

Part marks

(1)

- (b) Work out an estimate for the mean distance travelled to the factory each day.

(4)

One of these workers is chosen at random.

- (c) Write down the probability that this worker travels more than 20 km to the factory each day.

(2)

(Total for Question 3 is 7 marks)



Mark allocation of grades

Higher Tier

- 40% marks distributed evenly over grades 4 & 5
- 60% of marks distributed over grades 6, 7, 8 & 9

Foundation tier

- All marks distributed evenly over grades 1, 2, 3, 4 & 5

How marks are allocated

$$\sum AO1 = 60 \pm 3, \sum AO2 = 25 \pm 3, \sum AO3 = 15 \pm 3, \text{ and} \\ \sum AO1 + \sum AO2 + \sum AO3 = 100$$

And

$$\sum G1 + G2 + G3 + G4 + G5 = 100 \text{ and} \\ G1 = G2 = G3 = G4 = G5 = 20 \pm 1$$

And

$$\sum PS \approx 25, \sum R \approx 15 \text{ with } \sum PS + R = 40$$

This is for the Foundation level, paper F1, say.

The grid for Higher level, H1 will have a similar structure.

One additional constraint is that there have to be a considerable number of questions and hence marks common to F1 and H1, so changing a question on F tier can have a knock-on effect on H tier.



Writing a paper – stage 2

When the Principal Examiner completes the first draft of the paper AND mark scheme, it is sent via **secure** email transfer [live papers are **NEVER** just emailed] to the Chair of examiners and the Chief Examiner of the specification for the first scrutiny.

It is checked for adherence to the specification, suitability of content, level of demand etc.

On completion of this scrutiny, the Principal Examiner/Writer completes any corrections/changes recommended by the Chair and Chief.

Writing a paper – stage 3

Revision

Once the paper is updated it is sent to the revisor(s) who go through the paper in great detail, checking for

- Accuracy
- Adherence to the specification
- Grammar
- Demand
- Correct answers in the mark scheme

The revisor will usually offer some alternative wording for consideration before the next stage. The paper is sent back to the writer for further corrections/modifications – the object being to get the paper as well prepared for the next stage as possible.

Writing a paper – stage 4

QPEC

[Question paper evaluation committee]

The committee comprises of:

Chair/Chief/Writer/Edexcel subject officers/[observers]

The paper is gone through in great detail at this stage. We discuss every question/mark scheme to finalise the paper before the first printing [**stage 5**]. The content/demand/layout/grammar is all discussed and dissected to make sure everyone is happy with the final paper.

Writing a paper – stages 6 and 7

Stage 6

The paper is scrutinised by a subject expert. This colleague will complete the paper [firstly without reference to the mark scheme] to check that:

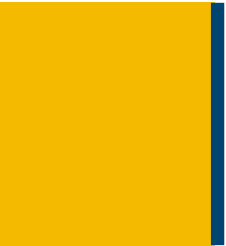
- It can be completed in the allocated time
- It contains no questions that are not in the specification
- Is mathematically sound
- There are no errors in the mark scheme – perhaps there are alternative solutions we should consider

Stage 7

The paper is checked by a proof reader. It is checked for:

- Correct grammar and spelling
- Suitable contexts – particularly for overseas candidates

If any mathematical/grammatical/printing errors are found, the paper is reprinted.



Writing a paper – stage 8 – sign off

Before the paper is progressed to Stage 8, there is an Additional Check by another scrutineer to apply one final scrutiny.

Stage 8

This last stage is the final check that all corrections have been implemented and the paper and mark scheme are both completely free from errors and can proceed to the final printing stage.

The paper is then signed off by the writer, the Chief Examiner and the Chair of Examiners.

Activity 1

Marking some exam questions.

Have a go at marking two questions in any way that you usually work.

Here is the first question with its mark scheme. This is from Q3 Paper 1HR June 2024 so is a common question at grade 4 with the Foundation paper.

3 Norberto sells white loaves of bread and brown loaves of bread.

He sells a total of 200 loaves such that

the number of white loaves sold : the number of brown loaves sold = 3 : 2

Norberto sells the white loaves for £1.50 each.

He sells the brown loaves for £1.75 each.

40% of the price of a white loaf is profit.

60% of the price of a brown loaf is profit.

Work out Norberto's total profit when he sells all 200 loaves.

£.....

(Total for Question 3 is 5 marks)

Mark scheme Q3

3	eg $200 \div (3 + 2) (= 40)$		5	M1	for a method to find one 'share' of the ratio
	eg $3 \times "40" (= 120)$ and $2 \times "40" (= 80)$			M1	for a method to find the number of white loaves and the number of brown loaves
	eg $"120" \times 1.50 (= 180)$ oe and $"80" \times 1.75 (= 140)$ oe or $"120" \times 0.4 (= 48)$ oe and $"80" \times 0.6 (= 48)$ oe or $0.4 \times 1.50 (= 0.6)$ oe and $0.6 \times 1.75 (= 1.05)$ oe			M1	for a method to find income from white loaves and brown loaves or number of white loaves and brown loaves that are entirely profit or profit from a single white loaf or a single brown loaf
	eg $0.4 \times "180" (= 72)$ oe and $0.6 \times "140" (= 84)$ oe or $"48" \times 1.50 (= 72)$ oe and $"48" \times 1.75 (= 84)$ oe or $"0.6" \times "120" (= 72)$ oe and $"1.05" \times "80" (= 84)$ oe			M1	for a complete method to find the total profit for the white loaves and the total profit for the brown loaves
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	156		A1	cao award SCB4 for an answer of 164 or 174
					Total 5 marks

Correct scoring for Question 3

Response 1

M0 no method to find one 'share' of the ratio
M0 no method to find the number of white loaves
and brown loaves
M1 for $1.5 \times 40/100$ and $1.75 \times 60/100$ (NOTE: this mark can be awarded
without the award of the previous 2 M marks if finding the profit for a single loaf)
M0 no
complete method
A0 incorrect answer
M0M0M1M0A0 - 1 mark

Response 2

M1 for $200 / 5$
M1 for 40×2 and 40×3
M1 for 120×1.50 and 80×1.75
M0 they have a
complete method to find the total profit for the white loaves but the method for brown loaves is
incorrect, they have used 80 instead of 140
A0 as the method to find the total profit for the
brown loaves is incorrect, student has done 60% of 80 instead of 120
M1M1M1M0A0 - 3 marks

Here is the second question; Q23 paper 1HR June 2024
As it is the final question in the paper it is a grade 9 question.

23 Here are the first three terms of an arithmetic sequence.

$$(4x-14) \quad , \quad (x+2) \quad , \quad (7x-9)$$

Find, as an integer, the sum of the first 40 terms of the sequence.
Show clear algebraic working.

(Total for Question 23 is 4 marks)

TOTAL FOR PAPER IS 100 MARKS

Mark Scheme Q23

23	$(7x - 9) - (x + 2) = (x + 2) - (4x - 14)$ oe eg $6x - 11 = 16 - 3x$ OR $x + 2 = 4x - 14 + d$ and $7x - 9 = 4x - 14 + 2d$ oe eg $-3x + 16 = d$ and $3x + 5 = 2d$		4	M1 for setting up an equation in x OR two simultaneous equations in x and d
	$x = 3$ and $a = -2$ and $d = 7$ OR $x = 3$ and eg $(S_{40} =) \frac{40}{2} [2(4x - 14) + 39(-3x + 16)]$ or $x = 3$ and eg $(S_{40} =) \frac{40}{2} [2(4x - 14) + 39(6x - 11)]$			M1 correct values or values from correct substitution OR $x = 3$ and S_{40} expressed in terms of x allow $(40 - 1)$ for 39
	$(S_{40} =) \frac{40}{2} (2 \times " - 2 " + 39 \times " 7 ")$ or eg $(S_{40} =) \frac{40}{2} [2(4 \times " 3 " - 14) + 39(-3 \times " 3 " + 16)]$ or $(S_{40} =) \frac{40}{2} [2(4 \times " 3 " - 14) + 39(6 \times " 3 " - 11)]$			M1 allow use of their a and their d or their x as long as clearly stated allow $(40 - 1)$ for 39
	<i>Working required</i>	5380		A1 (dep on M1)
				Total 4 marks

Correct scoring for Question 23

Response 1

M1 correct equation set up in x

M0 their values for x, a and d are incorrect - NOTE: we may not

see $a = -2$ or $d = 7$, we may see eg $4x - 14 = -2$ or $6x - 11 = 7$ or -2 and 7 substituted correctly into the 'sum of' formula - we will accept these for this mark

M1 as the student has clearly

stated their values of a and d, we allow the use of these and award M1 for correct use of the sum of

formula

A0 incorrect answer

M1M0M1A0 - 2 marks

Response 2

M0M0 their method to find their values for x, a and d is incorrect

M1 as the student has clearly

stated their values of a and d, we allow the use of these and award M1 for correct use of the sum of

formula

A0 incorrect answer

M0M0M1A0 - 1 mark

How papers are marked by Edexcel



The process on examination day and beyond

- The candidate sits the exam
- The examination officer packs up the scripts and sends them to Edexcel in Rotherham
- The spine is cut off the physical script and it is scanned in machines and stored ready for marking online.

Type of Examiner

Type 1

Expert examiner – can mark any question on the paper. Expert items are those which require a judgement of any form.

Type 2

Graduate Examiner – marks calculation only type questions.

Type 3

Clerical Examiner – marks those questions that are either correct or incorrect. No calculation or judgement is required.

For example

7 Harold works in a factory.

His normal hourly rate of pay is £14

His overtime hourly rate of pay is £21

Harold is paid the normal hourly rate of pay for 35 hours in one week.

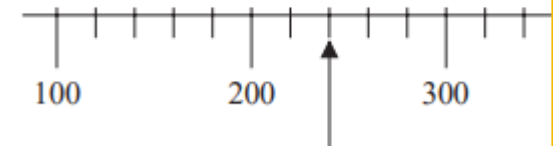
His total pay for this week is £679

Work out the number of hours of overtime he works in this week.

$$T = 4d - 6e$$

(b) Work out the value of T when $d = 13$ and $e = 7$

(b) Write down the number marked with the arrow.





How your student's papers are marked by Edexcel

Edexcel uses a marking platform called Epen

Epen is set up for each examination series by the Principal Examiner together with the Assistant PEs and Team Leaders on the specification.

This involves:

- Practice scripts – with annotations
- Qualification scripts – examiners must mark 10 Qualification scripts and must score at least 90% accuracy to pass
- Validity scripts which are pre-marked items by the team. Approximately 1 in 25 scripts marked by an examiner will be a Validity script to check accuracy.



Backreading

The senior assessment team back read examiners marking.

We take the following samples:

At the start of marking

CE1 – The first sample of initially 10 items of each question.

After 25%- 35% of the allocation

CE2 – The second sample again with 10 items of each question.

After 50% - 60% of the allocation

CE3 – the last sample is taken of 10 items per question.

A sample screen shot of what an examiner will see

Candidate response

Marking grid

2 Given that

$$1 - \frac{1}{3}x + \frac{5}{36}x^2 + \dots$$

is the binomial expansion, in ascending powers of x , of $(1 + Ax)^n$
where A and n are rational numbers,

(a) find the value of A and the value of n (6)

(b) Hence find the value of the coefficient of x^3
Give your answer in the form $-\frac{p}{q}$ where p is a prime number and q is an integer. (2)

a. $(1 + Ax)^n = 1 + n \cdot Ax + \frac{n(n-1) \cdot A^2 x^2}{1 \times 2} + \dots$

$$\begin{cases} n \cdot A = -\frac{1}{3} \\ \frac{n(n-1) \cdot A}{2} = \frac{5}{36} \end{cases}$$
$$n(n-1) \cdot A = \frac{5}{18}$$
$$An^2 - An = \frac{5}{18} \quad \text{①}$$

Sub $n = -\frac{1}{3A}$ into ①

Sub $A = -\frac{1}{3n}$ into ①

$$-\frac{1}{3n} \cdot n^2 - (-\frac{1}{3n}) \cdot n = \frac{5}{18}$$
$$-\frac{1}{3}n + \frac{1}{3} = \frac{5}{18}$$

WF: 179

RESPONSE: 1217120
DOC_ID: 0546001022843

Q02aB	0	1
Q02aM1	0	1
Q02aM2	0	1
Q02aM3	0	1
Q02aA1	0	1
Q02aA2	0	1
Q02bM	0	1
Q02bA	0	1

A sample screenshot of what the Team Leader will see.

Examiner
marks

TL
marks

WF: 179

RESPONSE: 1217120
DOC_ID: 0546001022843

2 Given that

$$1 - \frac{1}{3}x + \frac{5}{36}x^2 + \dots$$

is the binomial expansion, in ascending powers of x , of $(1 + Ax)^n$,
where A and n are rational numbers,

(a) find the value of A and the value of n (6)

(b) Hence find the value of the coefficient of x^3 (2)

Give your answer in the form $\frac{p}{q}$ where p is a prime number and q is an integer.
(No Title)

a. $(1 + Ax)^n = 1 + n \cdot Ax + \frac{n(n-1) \cdot A^2 x^2}{1 \cdot 2} + \dots$

$$\begin{cases} n \cdot A = -\frac{1}{3} \\ \frac{n(n-1) \cdot A^2}{2} = \frac{5}{36} \end{cases}$$
$$n(n-1) \cdot A = \frac{5}{18}$$
$$An^2 - An = \frac{5}{18} \quad \text{①}$$

Sub $n = -\frac{1}{3A}$ into ①

$$-\frac{1}{3A} \cdot n^2 - (-\frac{1}{3A}) \cdot n = \frac{5}{18}$$
$$-\frac{1}{3}n + \frac{1}{3} = \frac{5}{18}$$
$$-\frac{1}{3}n = \frac{5}{18} - \frac{1}{3}$$
$$n = \frac{1}{6}$$

Sub $n = \frac{1}{6}$ into $n \cdot A = -\frac{1}{3}$

$$\frac{1}{6} \cdot A = -\frac{1}{3}$$

Q02aB	0	1	0	0
Q02aM1	0	1	1	1
Q02aM2	0	1	1	1
Q02aM3	0	1	0	0
Q02aA1	0	1	0	0
Q02aA2	0	1	0	0
Q02bM	0	1	0	0
Q02bA	0	1	0	0

1ST
591668

BKR
535889TL

Skip

Exit Scoring

Other Actions

Examiner recruitment and training

Initial examiner training

Examiners can apply to mark for Edexcel using this website

<https://qualifications.pearson.com/en/support/support-for-you/assessment-associates/vacancies/working-with-us.html>

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*Assessment associate is a term we use for those involved in assessment work for Pearson, for example, examiners or external verifiers.

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...

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Edexcel BTEC Higher Level Programmes
Extended Project
BTEC NQF/RQF
Skilled For Life QA

Search results

14 matching jobs found

Your search criteria Keywords: Mathematics;

Examiner - GCE A Level - Mathematics (2017 Specification)

A GCE Maths (2017 Specification) Examiner marks candidates' responses in accordance with the pre-defined mark scheme, whilst adhering to conditions of recognition and examination procedures. Most subjects will be marked onscreen using ePEN, which can be done from home. A few subjects are still ... [Read more](#)

Examiner - GCE A Level Further Mathematics (2017 specification)

A GCE Further Mathematics (2017 Specification) Examiner marks candidates' responses in accordance with the pre-defined mark scheme, whilst adhering to conditions of recognition and examination procedures. Most subjects will be marked onscreen using ePEN, which can be done from home. A few sub ... [Read more](#)

Examiner - GCSE- Mathematics (2015 specification)

A GCSE Mathematics Examiner (2015 specification) will mark candidates' responses in accordance with the pre-defined mark scheme, whilst adhering to conditions of recognition and examination procedures. Most subjects will be marked onscreen using ePEN, which can be done from home. A few subject ... [Read more](#)

Examiner - International Advanced Level - Decision Mathematics (2018 specification)

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Stop a Pension
Pension Dashboard
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BTEC NQF/RQF
Skilled For Life QA
Skilled For Life SV
L1 Introductory (Graded)
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Forms and Guidance

Examiner - International Advanced Level - Decision Mathematics (2018 specification)

Reference: Ex/IALDM/2018spec

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An International Advanced Level Decision Mathematics Examiner will mark candidates' responses in accordance with the pre-defined mark scheme, whilst adhering to conditions of recognition and examination procedures. Most subjects will be marked onscreen using ePEN, which can be done from home. A few subjects are still marked in the traditional method, using paper scripts sent through the post. A high level of subject knowledge is necessary in order to apply the mark scheme. Each examiner will receive an agreed allocation of scripts.

We are also recruiting for the following:

[Examiner - International Advanced Level Pure Mathematics \(2018 Specification\)](#)

[Examiner - International Advanced Level Statistics \(2018 Spec\)](#)

[Examiner - International Advanced Level Further Pure Mathematics \(2018 specification\)](#)

[Examiner - International Advanced Level Mechanics \(2018 specification\)](#)

Responsibilities

- To mark accurately and consistently to ensure overall standards are maintained
- To submit samples to your Team Leader at designated times
- To ensure milestones for marking are adhered to
- To ensure all administration is completed as specified

Experience/ Qualifications Needed

- You will have one academic year's worth of teaching experience:
 - a. within the last 8 years
 - b. within the relevant qualification and subject
- You will have a degree or equivalent

Competencies Required

- You will have the ability to work well under pressure
- You will have the ability to meet deadlines
- You will have a high level of subject knowledge in order to apply the mark scheme

Additional Information

- The marking period is between May - July.

Initial examiner training

On successful appointment as an examiner, you will be offered a contract:

Contract Summary

Series	Subject group	Unit	Paper	Role	Issue Date	Status	
2406	Mathematics	Further Pure Mathematics (4PM1)	Unit 2: Mathematics (02)	Principal Examiner	Issued on 18/01/2024	Accepted on 23/01/2024	Details
2406	Mathematics	Further Pure Mathematics (4PM1)	Unit 1: Mathematics (01)	Chief Examiner	Issued on 30/01/2024	Accepted on 08/05/2024	Details
2406	Mathematics	Further Pure Mathematics (4PM1)	Unit 1: Mathematics (01R)	Principal Examiner	Issued on 17/01/2024	Accepted on 23/01/2024	Details
2406	Mathematics	Further Pure Mathematics (4PM1)	Unit 2: Mathematics (02R)	Chief Examiner	Issued on 08/05/2024	Accepted on 11/05/2024	Details

- Once a contract is accepted, all new examiners will be contacted to complete some initial training.
- The new examiner will be sent a mark scheme with some responses to mark.
- The new examiner marks the responses and send the marks to the Principal Examiner.
- This is then checked and the PE feeds back to the New Examiner.

Qualifying to mark any paper.

These are the steps an examiner **must** undertake to qualify to mark **ANY** paper.

1. 24 hours after the examination takes place, examiners download the paper and the mark scheme from Edexcel Gateway.
2. The examiner completes the paper and marks their own work using the mark scheme. Anything not understood/not clear must be communicated to the Team leader – who may clarify immediately or take comments to the Standardisation meeting.
3. After Epen is set up by the senior team on the paper, examiner must first complete Practice scripts. [There are usually between 5 and 7 of these]
4. After Practice has been completed, 10 Qualification scripts are marked. An accuracy of at least 90% must be achieved in order to qualify to mark. The TL will at this stage feedback on any errors and if necessary, ask the examiner to mark 15 examples of each question and stop until they have been cleared to mark their allocation.
5. The examiner is now qualified and cleared to mark!



Final steps

After marking

- The marks are processed and the statistical work is completed.
- The Principal Examiner prepares a report for the awarding committee [and also the Examination Report for publication post results day]
- Following statistical analysis the Awarding Meeting takes place. The awarding committee is comprised of the Chair of Examiners, the Principal Examiners and the Subject Officer from Edexcel. The meeting is recorded for the purposes of the Examination Regulator.
- The committee inspects scripts beforehand at around the proposed grade boundaries. The committee agrees on the boundary that will be submitted to the Awarding Body for approval.
- On Results Day – candidates receive their grades!

Examiner reports

Examiner report 1H June 2024

IGCSE Mathematics 4MA1 1H Principal Examiners Report

Students who were well prepared for this paper were able to make a good attempt at a majority of questions.

Students were less successful in producing a full treatment for surds (Q17), differentiating functions (Q18) and completing the square, particularly for negative quadratics (Q25).

On the whole, working was shown and mostly easy to follow. Those students who produce untidy, unstructured written work to the extent that their writing is almost illegible risk losing marks. There were some instances where students failed to read the question properly; an example being question 20. Here some students either did not realise they had to use the formula for the area of sector, but instead used the formula for arc length.

Finding probabilities in a context (Q16), transformations of functions (Q21), gaining answers from histograms (Q22), and manipulation of algebra in later questions (Q23), proved to be challenging for many. Reverse percentage in a context (Q4), also caused difficulty for less able students.

Generally, problem solving, and questions assessing mathematical reasoning (Q2, Q5, and Q7) were tackled well.

Question 4 Paper 1H June 2024

- 4 Ava records the number of kilometres she drives each month.

In April, Ava drove 943 kilometres.

This is 15% more than the number of kilometres she drove in March.

Work out the number of kilometres Ava drove in March.

..... kilometres

(Total for Question 4 is 3 marks)

Question 4

Students answered this question in two different ways – those who used the correct method of division by 1.15 or those who used the incorrect method of multiplication by 1.15. Careful reading of the question would help students realise that the 15% is a percentage increase of the original number of kilometres that Ava drove (in March) and not 15% decrease of the given number of kilometres driven by Ava (in April). Many students made the familiar mistake of simply finding 15% of 943 and adding it, or multiplying 943 by 1.15 or 0.85

Question 23

- 23 A solid shape is made by removing a hemisphere, shown shaded, from a cone as shown in the diagram.

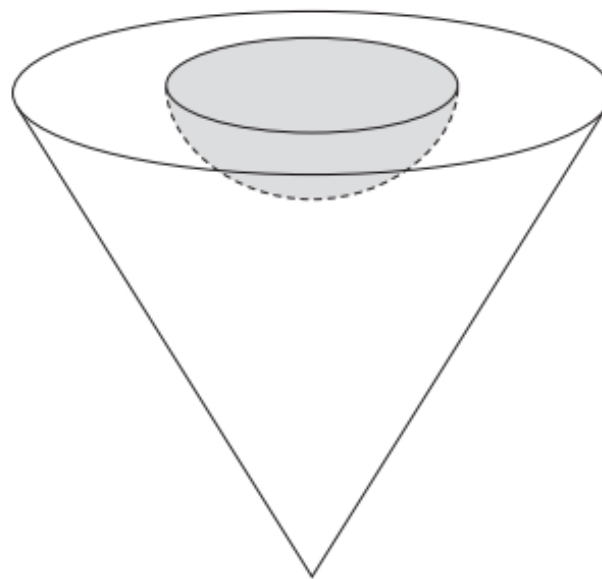


Diagram **NOT**
accurately drawn

The radius of the hemisphere is $2x$ cm

The radius of the base of the cone is $5x$ cm

The vertical height of the cone is $6x$ cm

The volume of the solid shape is $6948\pi \text{ cm}^3$

Work out the **total** surface area of the solid hemisphere that has been removed from the cone.

Give your answer correct to the nearest integer.

..... cm^2

(Total for Question 23 is 5 marks)

Question 23 Examiner report

Question 23

The formulae for the volume of a cone and the volume of a sphere are given on the formula sheet.

Many students wrote down $\frac{1}{3}\pi \times (5x)^2 \times 6x$ or $\frac{1}{2} \times \frac{4}{3} \times \pi \times (2x)^3$ to gain the first mark. However, students are encouraged to use brackets when substituting into a formula. If the student had not placed brackets around the 5x they generally lost the next 4 marks of the question. Numerous candidates gained the first mark but did not complete the question successfully.

The second mark was gained when the correct equation was set up for the volume of the shape by equating their expression with 6948π . Some students forgot to include the π with 6948, however, a special case was considered for this mishap. Working was made considerably easier if students cancelled π from their correct equation at an earlier stage.

Weak algebraic manipulation was the main cause of not finding the correct value of x . There was a reasonably large quantity of blank scripts suggesting that students either found this question too difficult to attempt or that they had run out of time to answer.

Examiner report 2R June 2024

IGCSE Mathematics 4MA1 2HR Principal Examiners Report

Students who were well prepared for this paper were able to make a good attempt at all questions. It was encouraging to see many students clearly showing their working. Students were less successful in using set theory, indices and working with prime factors.

On the whole, working was shown and was easy to follow through. There were some instances where students failed to read the question properly such as Q8 and Q14.

A striking weakness in students was solving problems with areas, writing a number as a product of prime factors in index form, applying trigonometry and using median, mode and range in context. On the whole, problem solving questions and questions assessing mathematical reasoning were not tackled well, this was particularly apparent, for example, in questions 10, 15, 21, 22 and 25

Elsewhere students are reminded of the importance of clear, legible presentation of their reasoning as too often mistakes are made through untidy and disordered work. This point is particularly pertinent in those questions requiring several steps to reach a solution or those that require detailed algebraic processes.

Question 10 - Examiner report

10 The diagram shows a hexagon $ABCDEF$

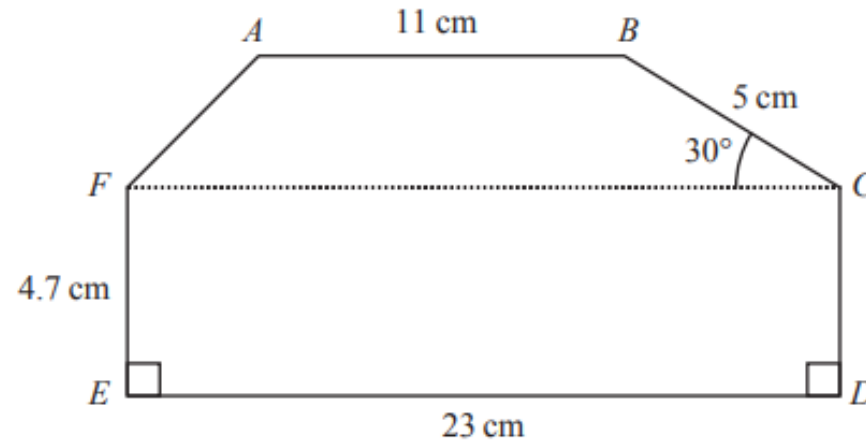


Diagram **NOT**
accurately drawn

Angle $BCF = 30^\circ$

AB , FC and ED are parallel.

Calculate the area of $ABCDEF$

Show your working clearly.

..... cm^2

(Total for Question 10 is 5 marks)

Question 10 - Examiner report

Question 10

This question saw varying degrees of success but did provide students with multiple routes to gaining marks. Many students found the area of the lower rectangle but made no further progress. Students who realised that the height of the trapezium was needed and used trigonometry correctly, generally went on to gain full marks; although few applied the area of a trapezium formula, despite it being on the Formulae sheet. A significant number of students treated the trapezium as a composite shape, with resulting mixed fortunes.



Activity 2 – Using Examiner reports

How could you use the Principal Examiner reports in your schools/centres?

Marking student responses – mark codes



Understanding Mark Schemes

Mark codes

- M. marks are awarded for a correct application of a method, or a correct attempt.
M marks can be dependent so that if a previous M mark is not scored, the subsequent M mark may not be either
- A. marks are awarded for a correct answer subject to a correct method being used.
The marking combination M0A1 is not possible
- B. marks are independent marks, usually for a 'write down'



Understanding Mark Schemes

Other abbreviations

Ft means follow through. Applied on some A or B marks

bod benefit of doubt

isw ignore subsequent working

cao correct answer only

cso correct solution only

d or **dep** is a dependent M mark

Marking student responses – short response questions

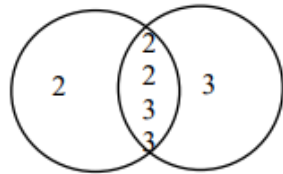
An example of a short response question – Q3 Paper

1H June 2024

- 3** Find the highest common factor (HCF) of 72 and 108
Show your working clearly.

(Total for Question 3 is 2 marks)

Mark Scheme

	Working	Answer	Marks	Additional notes									
3	<p>1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72 and 1, 2, 3, 4, 6, 9, 12, 18, 27, 36, 54, 108</p> <p>or</p> <p>2 2 2 3 3 oe and 2 2 3 3 3 oe</p> <p>or</p> <div><table data-bbox="761 933 1016 1048"><tr><td>12</td><td>72</td><td>108</td></tr><tr><td>3</td><td>6</td><td>9</td></tr><tr><td></td><td>2</td><td>3</td></tr></table></div>	12	72	108	3	6	9		2	3		2	<p>M1 for any correct valid method and no errors eg</p> <p>for starting to list at least four different factors of each number and no errors</p> <p>or</p> <p>2 2 2 3 3 and 2 2 3 3 3 seen or 4 2 3 3 and 4 3 3 3 seen or 2 2 2 9 and 2 2 3 9 seen or 4 2 9 and 4 3 9 seen or 2 36 and 3 36 etc (may be in a factor tree or a ladder diagram with no errors and ignore 1)</p> <p>or a fully correct Venn diagram</p> <p>or other clear method, eg table</p>
12	72	108											
3	6	9											
	2	3											
	<i>Working required</i>	36		A1 dep on M1 Accept $2^2 \times 3^2$ oe									
				Total 2 marks									

Activity 3

Complete this question **WITHOUT** reference to the mark scheme, and then check your own answer.

Question 3 a student response

M1 – for 2, 2, 2, 3, 3,
AND 2, 2, 3, 3, 3

At the branch of each factor tree with no errors.

A0 – Incorrect answer as 216 is given on the answer line.
We can see 36 [the correct answer] but the candidate has multiplied it by 2 and 3.
If $36 \times 2 \times 3$ was not seen – we could have awarded this mark

3 Find the highest common factor (HCF) of 72 and 108
Show your working clearly.

72
 $8 \quad 9$
 $4 \quad 2 \quad 3 \quad 3$
 $2 \quad 2$
 $= 2^3 \times 3^2$

108
 $2 \quad 54$
 $6 \quad 9$
 $3 \quad 2 \quad 3 \quad 3$
 $= 2^2 \times 3^3$

$72 = 2 \times 2 \times 2 \times 3 \times 3$
 $108 = 2 \times 2 \times 3 \times 3 \times 3$
 $2 \times 2 \times 3 \times 3 = 36$

$36 \times 2 \times 3 = 216$

216

(Total for Question 3 is 2 marks)

Activity 4 Question 4 Paper 1H [Grade 4] 2024

In your Delegate Packs there are three student responses on this question for you to mark. This question was highlighted in the PE report as poorly answered.

You will be now be marking to examination board standard [imagine you're an examiner working for Edexcel] – so please mark this using the codes M1, A1 when you see them scored. If it does not score – then write M0 etc.

4 Ava records the number of kilometres she drives each month.

In April, Ava drove 943 kilometres.

This is 15% more than the number of kilometres she drove in March.

Work out the number of kilometres Ava drove in March.

Q4 Paper 1H June 2024 Mark Scheme

	Working	Answer	Marks	Explanatory notes
4	$1 + 0.15 (= 1.15)$ or $x + 0.15x = 943$ or $100(\%) + 15(\%) (= 115(\%))$ or $\frac{943}{115} (= 8.2)$ oe		3	M1
	$943 \div "1.15"$ or $943 \div "115" \times 100$ or $943 \times 100 \div "115"$ oe or 8.2×100			M1 dep on M1
	<i>Working not required, so correct answer scores full marks (unless from obvious incorrect working)</i>	820		A1
				Total 3 marks

Answers to activity 4

Response 1 M0 – for working out 0.85 (must add 0.15 to 1 OR 15 to 100 oe)
 M0 – Incorrect working
 A0 – Follows M0

Response 2 M1 – for 1.15 seen
 M1 – for 943.1/15 seen
 A0 – Incorrect answer

Response 3 M0 – for using 0.85. [although 1.15 is seen but not used). We mark the method
 that leads to the answer on the answer line].
 M0 – for using 0.85 in their method.
 A0 – follows M0

Marking student responses – medium response questions

Example 1 – June 2024 Paper 1 Question 20

This question was highlighted in the PE report as poorly answered.

20 The diagram shows a sector $OABC$ of a circle centre O

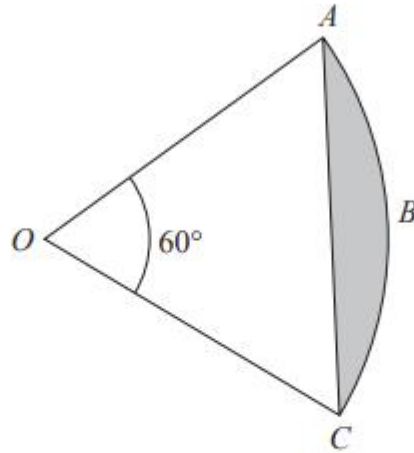


Diagram **NOT**
accurately drawn

Angle $AOC = 60^\circ$

The area of the shaded segment ABC is 38 cm^2

Work out the perimeter of the shaded segment ABC
Give your answer correct to one decimal place.

..... cm

(Total for Question 20 is 4 marks)

Activity 5
Complete this
question
WITHOUT
reference to the
mark scheme,
and then check
your own answer.

Question 20 Paper 1H Mark Scheme

20	eg $\pi r^2 \times \frac{60}{360} - \frac{1}{2} r^2 \sin 60$ oe or $\frac{\pi r^2}{6} - \frac{\sqrt{3}}{4} r^2$ oe		4	M1 for a correct expression for the area of the segment Expression may be embedded in an equation, eg $\pi r^2 \times \frac{60}{360} - \frac{1}{2} r^2 \sin 60 = 38$ or $\pi r^2 \times \frac{60}{360} = 38 + \frac{1}{2} r^2 \sin 60$ or $\pi r^2 \times \frac{60}{360} - 38 = \frac{1}{2} r^2 \sin 60$
	eg $(r^2 =) 38 \div \left(\frac{\pi}{6} - \frac{\sqrt{3}}{4} \right) (= 38 \div 0.09(058)) (= 419(490...))$ oe or $(r =) \sqrt{38 \div \left(\frac{\pi}{6} - \frac{\sqrt{3}}{4} \right)} (= 20.4(81...))$ oe			M1 dep on M1 for a correct expression for r^2 or r
	$\frac{\pi}{6} \times "20.4(81...)" \times 2 (= 21.4(48...))$ oe or			M1 for using the value of r to find arc length
	<i>Working not required, so correct answer scores full marks (unless from obvious incorrect working)</i>	41.9		A1 allow 41 - 42
				Total 4 marks

Candidate response Q20 Paper 1H

M1 for a correct expression for the segment

M1 for rearranging to r or r squared – both 419....
And 20.48... seen

M1 for sight of 21.4

A0 the candidate has not added 20.4 to 21.4

20 The diagram shows a sector $OABC$ of a circle centre O

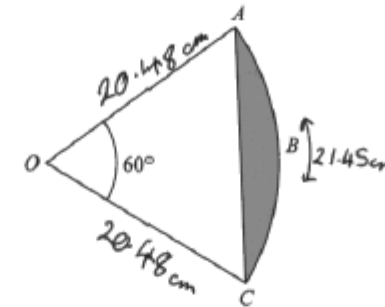
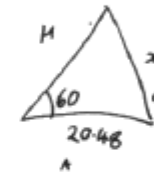


Diagram NOT
accurately drawn

Angle $AOC = 60^\circ$

The area of the shaded segment ABC is 38 cm^2

Work out the perimeter of the shaded segment ABC
Give your answer correct to one decimal place.



$$\frac{60}{360} \pi r^2 - \frac{1}{2} r^2 \sin(60) = 38$$

$$\tan(60) = \frac{x}{20.48}$$

$$r^2 \left(\frac{60}{360} \pi - \frac{1}{2} \sin(60) \right) = 38$$

$$x = \frac{20.48 \tan(60)}{1}$$

$$r^2 = \frac{38}{\left(\frac{60}{360} \pi - \frac{1}{2} \sin(60) \right)} = 419.49$$

$$x = 20.48 \times \tan(60) = 35.47 \text{ cm}$$

$$r = \sqrt{419.49} = 20.48 \text{ cm}$$

$$\frac{60}{360} \pi (40.96) = 21.45 \text{ cm}$$

$$+ 35.47 \text{ cm} = 56.9 \text{ cm}$$

(Total for Question 20 is 4 marks)



Activity 6 Question 20 Paper 1

Now please mark the two responses in the delegate booklet.

Question 20 Paper 1H June 2024

Activity 6 Answers

Response 1

M1 for $(1/6) r^2 - r^2 \sin 60$ (= 38)

M0 for incorrectly rearranging for r^2

M0A0

Response 2

M1 for a correct expression for the area of the segment

M1 for sight of 419 or for
20.4..

M1 for sight of 21.4..

A0

Marking student responses - Extended response questions

Extended questions part (1)

Question 20 Paper 1 HR June 2024

20 (a) Express $2x^2 - 11x + 9$ in the form $a(x - b)^2 - c$ where a , b and c are numbers to be found.

(3)

The curve C has equation $y = 2(x - 3)^2 - 11(x - 3) + 9$

The point P is the minimum point on C

(b) Find the coordinates of P

(2)

Activity 7 – Please now mark the two responses of Question 20 in the booklet.

Mark Scheme Q20 paper 1HR June 2024

20	(a)	$2\left(x^2 - \frac{11}{2}x\right) + \dots$ or $2\left(x^2 - \frac{11}{2}x + \dots\right)$ oe		3	M1	for taking out a factor of 2
		$2\left[\left(x - \frac{11}{4}\right)^2 - \frac{11^2}{4^2}\right] + \dots$ or $2\left[\left(x - \frac{11}{4}\right)^2 - \frac{11^2}{4^2} + \dots\right]$ oe			M1	for correctly completing square
		<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	$2\left(x - \frac{11}{4}\right)^2 - \frac{49}{8}$		A1	oe, eg $2(x - 2.75)^2 - 6.125$ allow $a = 2$, $b = \frac{11}{4}$ oe, $c = \frac{49}{8}$ oe if no other marks awarded, award SCB1 for $2\left(x - \frac{11}{4}\right)^2 + \dots$
	ALTERNATIVE					
ALT	(a)	$ax^2 - 2bax + b^2a - c$		3	M1	for correctly expanding $a(x - b)^2 - c$ to give $ax^2 - 2bax + b^2a - c$
		$-2ba = -11$ or $2ba = 11$ and $b^2a - c = 9$			M1	for setting up 2 equations using the coefficient of x and the numerical term
		<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	$2\left(x - \frac{11}{4}\right)^2 - \frac{49}{8}$		A1	oe, eg $2(x - 2.75)^2 - 6.125$ allow $a = 2$, $b = \frac{11}{4}$ oe, $c = \frac{49}{8}$ oe if no other marks awarded, award SCB1 for $2\left(x - \frac{11}{4}\right)^2 + \dots$
	(b)		$\left(\frac{23}{4}, -\frac{49}{8}\right)$	2	B2ft	oe, eg (5.75, -6.125) (B1ft for one correct coordinate)
					Total 5 marks	

Answers to Q20

Response 1

(a) 0 marks - they have attempted to take out a factor of 2 and complete the square but their method is incorrect
MOM0A0 - 0 marks
(b) B2 - they started again and used calculus to find the minimum point, their values are correct so award 2 marks
B2 - 2 marks

Response 2

(a) 0 marks - they have attempted to take out a factor of 2 and complete the square but their method is incorrect
MOM0A0 - 0 marks
(b) B1ft - their x-value is correct ft their answer to (a).
For the ft, marks can be awarded if the x-value is their $b + 3$ and if their y-value is equal to their $-c$ from part (a). Both marks are B marks for this part so ignore any method seen and mark the values given for the answer.
B1ft - 1 mark

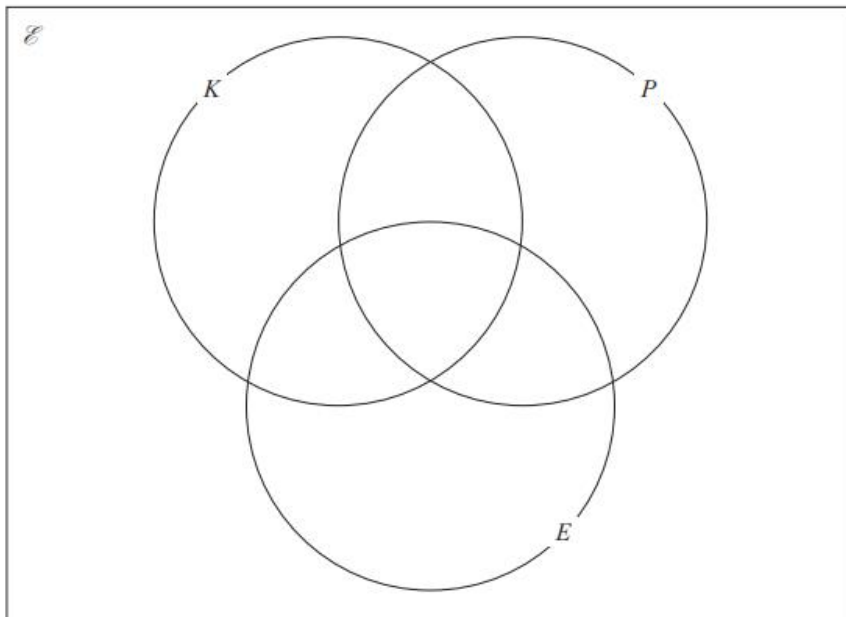
Question 16 Paper 2H June 2024

- 16 60 art students were asked if they would like to attend workshops for knitting (K), for photography (P) or for embroidery (E)

Of these students

- 9 chose knitting, photography and embroidery
- 17 chose knitting and photography
- 16 chose photography and embroidery
- 20 chose knitting and embroidery
- 28 chose photography
- 39 chose embroidery
- 2 chose none of the workshops

- (a) Using this information, complete the Venn diagram to show the numbers of students in each subset.



(3)

One of the students is chosen at random.

Given that this student chose photography,

- (b) find the probability that this student also chose knitting.

(2)

- (c) Find $n(P \cap K')$

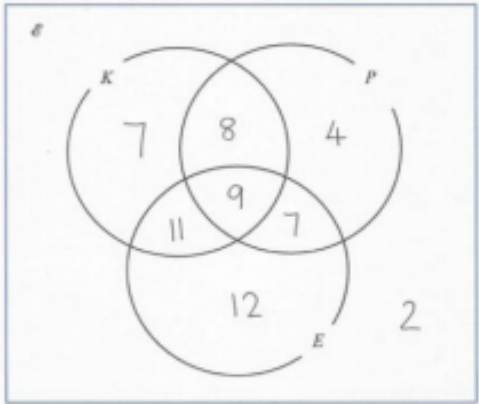
(1)

- (d) Find $n([P \cup E] \cap K)$

(1)

(Total for Question 16 is 7 marks)

Mark Scheme Q16 paper 2H June 2024

16 (a)		Fully correct Venn diagram	3	<p>B1 For 7 in just knitting</p> <p>B2 For all 7 others correct (B1 for 4, 5 or 6 others correct)</p>
(b)	can either ft their Venn diagram or use values given in text	$\frac{17}{28}$	2	<p>B2 ft oe 0.61 or 61% or 0.607... or 60.7% or better</p> <p>(B1ft for 17 as numerator or 28 as denominator in a fraction between 0 and 1)</p> <p>only ft where regions in Venn diagram have numbers indicated</p>
(c)	can either ft their Venn diagram or use values given in text	11	1	B1ft only ft where regions in Venn diagram have numbers indicated
(d)	can either ft their Venn diagram or use values given in text	28	1	B1ft only ft where regions in Venn diagram have numbers indicated
				Total 7 marks

Answers to marking

Response 1

Annotation

(a) B1 for just knitting with 7; there are only 3 other values correct

(b) B1 for 17 as

numerator in a fraction from the correct answer. (this value is seen in the text). The student would have gained full marks for 16/30

(c) B1 for 14 ($3 + 11$)

(d) B0 as for their diagram it should be 27

Response 1

(a) B3 for all values correct in Venn diagram.

(b) B2 for 17/28 or 61%

(c) B0 choice and we do not see the correct answer anyway.

(d) B0 choice

Marking student responses – 'show' questions

'Show that' questions

Here is an example of a 'show' question

This question is from 4PM1 Paper 01R June 2024 and illustrates the need to always show ALL working especially in a show question very clearly.

3

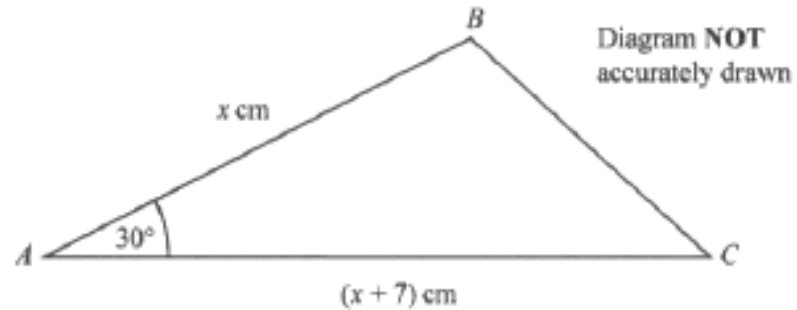


Figure 1

Figure 1 shows triangle ABC where

$$AB = x \text{ cm} \quad AC = (x + 7) \text{ cm} \quad \angle BAC = 30^\circ$$

The area of triangle $ABC = 36 \text{ cm}^2$

(a) Show that $x = 9$

(3)

(b) Find, in cm to 3 significant figures, the length of BC

(2)

(c) Find, in degrees to one decimal place, the size of

(i) $\angle ABC$

(ii) $\angle ACB$

Mark scheme from Q3 4PM1 – Paper 01R June 2024

Question	Scheme	Marks
3(a)	$36 = \frac{1}{2} \times x \times (x+7) \times \sin 30^\circ \Rightarrow 36 = \frac{x(x+7)}{4} \Rightarrow x^2 + 7x - 144 = 0$ [Accept also e.g., $x^2 + 7x = 144$] $(x-9)(x+16) = 0 \Rightarrow x = 9, (-16) \text{ (cm)}^*$	M1 M1A1 cso [3]
(b)	$BC = \sqrt{9^2 + 16^2 - 2 \times 9 \times 16 \cos 30^\circ} = 9.3586... \approx 9.36 \text{ (cm)}$	M1A1 [2]
(c)(i)	$\frac{\sin ABC}{16} = \frac{\sin 30^\circ}{9.3586} \Rightarrow \angle ABC = 180^\circ - 58.7408... \approx 121.3^\circ$	M1A1
(ii)	$\angle BCA = 180^\circ - 30^\circ - 121.259^\circ = 28.740... \approx 28.7^\circ$	B1ft [3]
Total 8 marks		

Part	Mark	Notes
(a)	M1	Applies $\frac{1}{2} ab \sin C$ correctly with the given lengths to form a 3TQ in terms of x
	M1	Solves their 3TQ by any correct method to find the value of x This is a show question – this step MUST be seen
	A1 cso	For $x = 9$ Sight of $x = -16$ not rejected is A0
(b)	M1	Applies cosine rule correctly to find the length BC
	A1	For the correct length awrt 9.36 (cm)
	ALT	
	M1	Finds the height of the triangle from vertex B [4.5 cm] and applies trigonometry or Pythagoras theorem to find the length of the point from the base of the perpendicular to C $AX^2 = 9^2 - 4.5^2 = \frac{243}{4} \Rightarrow XC = 16 - \sqrt{\frac{243}{4}}$ $BC = \sqrt{4.5^2 + \left(16 - \sqrt{\frac{243}{4}}\right)^2} = \dots$
	A1	For the correct length awrt 9.36 (cm)

Activity 8

In the delegate booklet are 4 examples of a simple 'show that' question.
Just mark part (a)

Each response has successfully and correctly found that $x = 9$ [cm]

However, how many marks would you award to each response?

A – M1M1A1 – full working is seen – this is a model answer

B – M1M1A1 – full working is seen this time using the formula.

C – M1M0A0 – The application of the area of a triangle is correct for M1, but there is no method **seen** to solve the resulting 3TQ.

D – M1M1A1 – When multiple attempts at a question are seen, we mark each one and score the lowest. However, in this case we gave bod that the candidate is not presenting two solutions for the examiner to choose so we marked the solution to the 3TQ presented on page 2 of their working.

And finally:



In summary, please teach your students to:

- Read every part of every question carefully.
- Write legibly and organise work as neatly as possible.
- Show ALL working – bullet point 4 at the front of the paper clearly states:
 - ‘Without sufficient working, correct answers may be awarded no marks’.
- Write in black ink.
- Practice using the formula page BEFORE the exam.
- Look at the allocation of marks for each question carefully.
 - This informs the candidate how much time/detail should be given to each question/part question.

Introducing International GCSE Modular

The two different routes of Assessment

If you're happy with the linear approach, there is no pressure to move to the modular route; our linear International GCSEs will continue to be offered and taken widely by students around the world.

Modular route



Unit assessments can be taken over multiple exam series.

Grades are calculated on raw marks which are then converted to a UMS (Uniform Mark Scale).

Students can re-sit individual units in any exam series.

Once a student has all their unit results, they can 'cash in' these results for their grade.

A modular route
is only offered
by Pearson
Edexcel at
International
GCSE

Linear route



Assessments for all units are taken together in one exam series.

Grades are calculated on raw marks only.

Students can re-sit assessments for all units together in one exam series.

The grade students receive are calculated at the end of the exam series in which they sat their assessments.

Modular exam structure

The modular and linear approach contact the same content, but the modular approach breaks the journey into two units with an exam at the end of each unit.

Unit 1	Unit 2
Foundation Tier <ul style="list-style-type: none">• Duration: 2 hours• Total number of marks: 100• Weighting: 50%• Grad range: 5-1	Foundation Tier <ul style="list-style-type: none">• Duration: 2 hours• Total number of marks: 100• Weighting: 50%• Grad range: 5-1
Higher Tier <ul style="list-style-type: none">• Duration: 2 hours• Total number of marks: 100• Weighting: 50%• Grad range: 9-4 with an allowable grade 3	Higher Tier <ul style="list-style-type: none">• Duration: 2 hours• Total number of marks: 100• Weighting: 50%• Grad range: 9-4 with an allowable grade 3
For each unit exam, a formulae sheet will be included, and the use of a calculator is permitted.	
Approximately 40% of questions are the same across Foundation and Higher Tier papers.	

Modular content summary

The modular and linear approach contact the same content, but the modular approach breaks the journey into two units with an exam at the end of each unit.

Unit 1	Unit 2
<p>Number (AO1)</p> <ul style="list-style-type: none">• Basic number skills• Standard form• Limits of accuracy• Surds and indices	<p>Number (AO1)</p> <ul style="list-style-type: none">• Ratio and proportion• Percentage skills• Standard form• Repeated percentage change
<p>Algebra (AO1)</p> <ul style="list-style-type: none">• Basic algebra skills• Set notation• Plotting graphs• Solving basic quadratics $x^2 + bx + c = 0$• Solving quadratics $ax^2 + bx + c = 0$• Completing the square• The quadratic formula	<p>Algebra (AO1)</p> <ul style="list-style-type: none">• Inequalities• Simultaneous equations• Sequences• Change of subject• Algebraic proof• Direct and inverse proportion• Summation of arithmetic series• Function notation and transformations• Differentiation
<p>Topics in black: studied by both Foundation and Higher Tiers students Topics in red: studied by Higher Tier students only.</p>	

Modular content summary, cntd.

The modular and linear approach contain the same content, but the modular approach breaks the journey into two units with an exam at the end of each unit.

Unit 1	Unit 2
<p>Shape, Space and Measure (AO2)</p> <ul style="list-style-type: none">• Properties and areas of shapes• Trigonometry• Pythagoras' theorem• Compound measures (speed, density)• Sine and Cosine rule• Sine area of a triangle• 3D Pythagoras' theorem	<p>Shape, Space and Measure (AO2)</p> <ul style="list-style-type: none">• Angles in polygons and circles• Symmetry• Constructions• Volume• Similarity• Transformations• Circle theorems• Similar area and volume• Vectors
<p>Handling Data (AO3)</p> <ul style="list-style-type: none">• Basic probability• Tree diagrams• Conditional probability• Histograms	<p>Handling Data (AO3)</p> <ul style="list-style-type: none">• Statistical measure• Cumulative frequency diagrams
<p>Topics in black: studied by both Foundation and Higher Tiers students Topics in red: studied by Higher Tier students only.</p>	



Teaching and planning in a Modular Way

Planning your teaching, producing a scheme of work

You may want to change the way you teach the International GCSE Mathematics A Specification Content if you take the Modular route for assessment.

- To support your planning and teaching of the course, we are producing **course planners**, **editable schemes of work** and **Getting Started Guide**.

The editable schemes of work are in Word so that you can copy and paste them/adjust them to suit the needs of your school.

- First teaching for International GCSE Mathematics A (Modular) is September 2024
- First assessment of International GCSE Mathematics A (Modular) is May/June 2025



Re-sits for Modular International GCSE

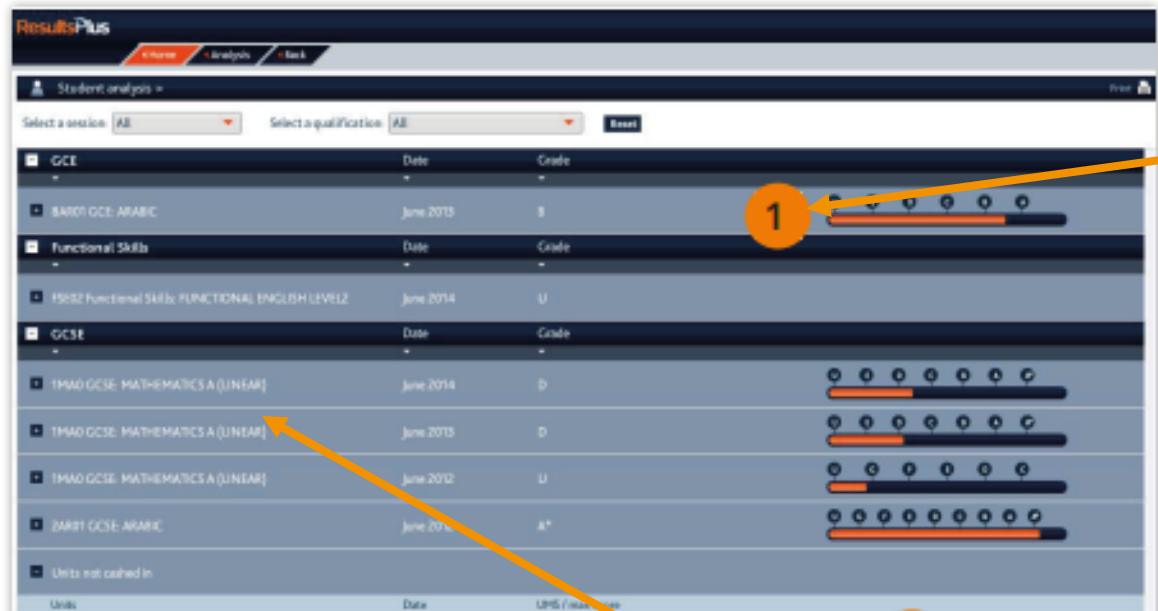
- Learners can re-sit any unit irrespective of whether the qualification is to be cashed in.
- If a learner resits a unit more than once, only the better of the two most recent attempts of that unit will be available for aggregation to a qualification grade.
- Results of units will be held in Pearson Edexcel's unit bank for as many years as this specification remains available.
- Once International GCSE in Mathematics A (Modular) has been certificated, all unit results are deemed to be used up at that level. These results cannot be used again towards a further award of the same qualification at the same level.



Using Data to help
with planning

Using data from Results Plus to inform planning

Student results overview



The screenshot shows the 'Results Plus' interface with the 'Student analysis' tab selected. The table displays results for various subjects and qualifications. Two callouts are present: one pointing to a grade boundary in the 'BASIC GCE: ARABIC' row, and another pointing to the 'TMAO GCSE: MATHEMATICS A (LINEAR)' row.

Qualification	Date	Grade	Progress
GCE			
BASIC GCE: ARABIC	June 2013	B	1
Functional Skills			
FSB2 Functional Skills: FUNCTIONAL ENGLISH LEVEL 2	June 2014	U	
GCSE			
TMAO GCSE: MATHEMATICS A (LINEAR)	June 2014	D	
TMAO GCSE: MATHEMATICS A (LINEAR)	June 2013	D	
TMAO GCSE: MATHEMATICS A (LINEAR)	June 2012	U	
ZARBI GCSE: ARABIC	June 2014	A*	
Units not cashed in			
Units	Date	Units / Results	

You can see how close the student was to a grade boundary

Other subjects

Using data from Results Plus to inform planning

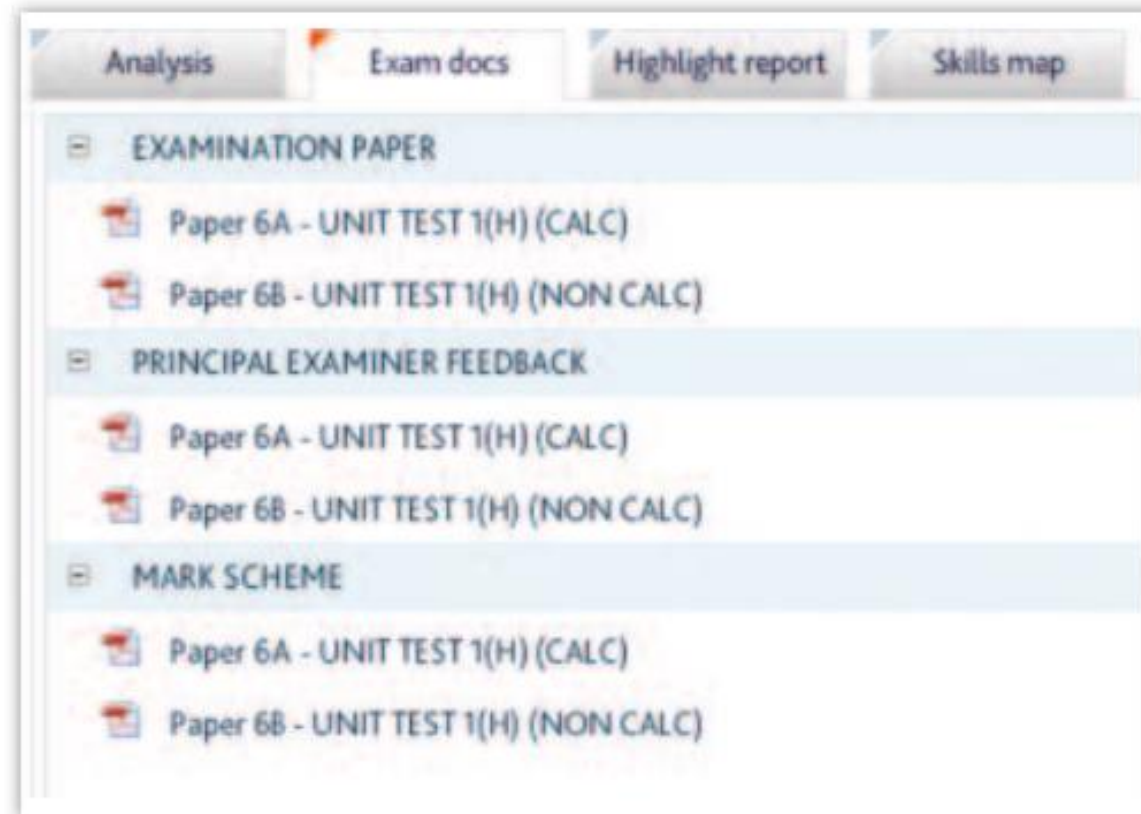
Individual exam paper analysis for a student

Question	Score	Performance	Edexcel Ave: ALL	Residual	Skill tested
Q01a	1/1	Over 70%	0.62/1	Green	Green
Q01b	0/2	Under 35%	1.22/2	Red	Red
Q02	3/3	Over 70%	2.69/3	Green	Green
Q03	1/4	Under 35%	3/4	Red	Red
Q04	0/4	Under 35%	2.48/4	Red	Red
Q05	0/2	Under 35%	1.64/2	Red	Red
Q06a	1/1	Over 70%	0.73/1	Green	Green
Q06b	0/2	Under 35%	1.08/2	Red	Red
Q07	1/4	Under 35%	3.13/4	Red	Red
Q08	1/3	Under 35%	1.93/3	Red	Red
Q09a	0/2	Under 35%	1.7/2	Red	Red
Q09b	1/2	Under 35%	1.49/2	Red	Red
Q10	0/3	Under 35%	2.05/3	Red	Red
Q11	0/3	Under 35%	1.28/3	Red	Red
Q12a	1/3	Under 35%	1.99/3	Red	Red
Total:	15/100		47.32/100		

1. Select the exam paper
2. You can see the score achieved
3. You can scroll down to see the whole paper
4. You can see how well the student performed on each question. You can sort any column to identify strengths and weaknesses. You can use this in Parents evenings and in you planning a revision schedule.
5. Edexcel averages compare your students' performance with that of all students
6. These are residuals which help to compare performance against Edexcel averages
7. You can see which skills are being tested in each question
8. What curriculum topic was tested

Using data from Results Plus to inform planning

All examination documents



All examination papers, mark schemes and Principal examiner reports are published in Results Plus as well.

Using data from Results Plus to inform planning

Skills maps

ResultsPlus | HIGH HOLBORN | GCSE Results for June 2012 | edexcel

Results menu | Back

Results for GCSE BIOLOGY 1 FOUNDATION TIER

Analysis | Exam docs | Highlight report | Skills map

Select skills map: GCSE Biology 1F Content, GCSE Biology 1F Content, Biology 1F Skills, Biology 1F HSW

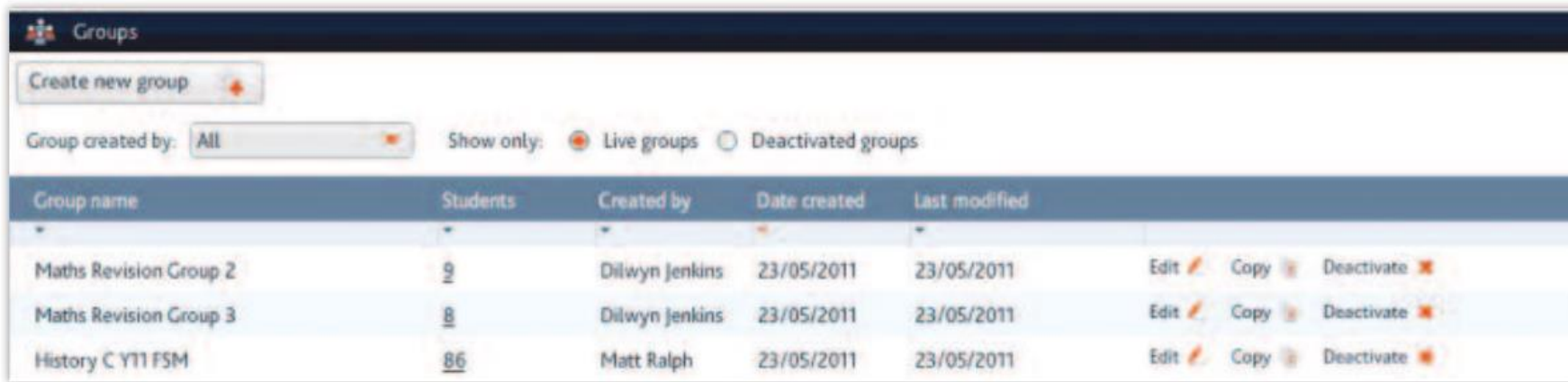
Show: All skills

	Score	Percentage	Edexcel Ave: All s
Unit B1: Influences on life	41.4/60	69%	67%
Topic 1 - Classification, variation and inheritance	14.4/20	72%	72%
Topic 2 - Responses to a changing environment	10.7/20	53%	51%
2.1 Define homeostasis as the maintenance of a stable...	2.9/5	58%	37%
2.2 Explain why a stable internal environment is importa...	3.4/8	43%	58%
2.3 Demonstrate an understanding of how organisms are...	4.4/7	63%	57%
2.4 Demonstrate an understanding of the process of vaso...	-	-	-
2.5 Recall that the central nervous system consists of the...	-	-	-
2.6 Describe how stimulation of receptors in the sense org...	-	-	-
2.7 Investigate human responses to external stimuli	-	-	-
2.8 Describe the pathway from stimulus to response...	-	-	-
2.9 Demonstrate an understanding of a simple reflex arc...	-	-	-
2.10 Explain how a coordinated response to a stimulus is...	-	-	-

1. Skills maps allow you to see performance in skills areas.
2. You can click on a topic to see more detail
3. You can see how many marks were scored in each topic
4. How students performed relative to other candidates
5. Some subjects have different skills maps
6. Colours indicate how well a student performed using a traffic light code.
7. You can filter the skills maps using drop down menus.

Using data from Results Plus to inform planning

Setting up a class/cohort groups



Groups

Create new group

Group created by: All Show only: ☒ Live groups ☐ Deactivated groups

Group name	Students	Created by	Date created	Last modified	
Maths Revision Group 2	9	Dilwyn Jenkins	23/05/2011	23/05/2011	Edit Copy Deactivate
Maths Revision Group 3	8	Dilwyn Jenkins	23/05/2011	23/05/2011	Edit Copy Deactivate
History C Y11 FSM	86	Matt Ralph	23/05/2011	23/05/2011	Edit Copy Deactivate

- You can select a group and see how that group performed in comparison with other groups
- You can see a summary of all results in a particular group

Using data from Results Plus to inform planning

Group analysis



- 4. The total number of students
- 5. Hovering over the grade bar shows the number of students achieving that grade
- 6. Individual student grades are shown in that group

Using data from Results Plus to inform planning

Group paper analysis

ResultsPlus | HIGH HOLBORN | edexcel

Home | Group menu | Groups | Back

Group analysis > Results for 'TEST Copy of 11a3 chem structured' > 5018F GCSE Unit: ADDITIONAL SCIENCE C2

Overview | Analysis | Exam docs | Highlights report | Skills map | Select skills map: GCSE Additional Science (2703) F ST...

Paper: Paper 1F - STRUCTURED PAPER C2

Over 70% 35 - 70% Under 35% Not tested

First name	Last name	Paper mark	
FAITH C	LYTHGOE	0/30	View student analysis
LYDIA	HARVEY	12/30	View student analysis
JOANNE B	KITCHIN	16/30	View student analysis
JACOB	BUNN	24/30	View student analysis

You can navigate easily between the overview of students, paper analysis, exam documents, highlight reports and skills maps.

Using data from Results Plus to inform planning

Group/cohort analysis reports are similar to the student individual analysis reports



2. Select the required exam paper
3. For EACH question you can see the average score achieved by students in this group
4. You will need to scroll down to see the scores
5. The performance column shows how the group performed on each question
6. You can sort any column to help identify strengths and areas for development
7. You can compare your group's performance with Edexcel averages
8. Residuals help spot quickly where your students outperformed or underperformed against Edexcel averages
9. You can see which curriculum area was tested in any particular question
10. You can PRINT any of these reports.



Support

Support for you at every stage

Free Resources and support	Planning, teaching and learning	Exam preparation and assessment	Results support
Getting Started Guide	✓		
Training Events (Face-to-Face & Online)	✓		
Subject Advisor Support	✓	✓	✓
Free access to the Maths Emporium website	✓	✓	
Schemes of Work	✓		
Lesson Plans*	✓		
Skills Mapping	✓		
Sample Assessment Materials	✓	✓	
Examiner Reports	✓	✓	✓
Exemplar Marked Responses	✓	✓	
Past Papers		✓	
Onscreen Mocks Service*		✓	
examWizard		✓	
Mark Schemes		✓	
ResultsPlus Mock Exam Analysis		✓	
Results Plus		✓	✓
Access to Scripts Service (ATS)			✓

* Available for Pearson Edexcel International GCSE (9-1) Mathematics A

Teaching and Learning Materials online

Switch to Pearson Edexcel International
GCSE Mathematics



New Modular International GCSE giving you a choice between linear or modular assessment > [Learn more](#)

Course materials

FILTERS

CATEGORIES

- ☒ Specification and sample assessments (4)
- ☐ Exam materials (120)
- ☐ Teaching and learning materials (40)

CONTENT TYPE

- ☒ All
- ☐ Notice (1)
- ☐ Sample assessment material (2)
- ☐ Specification (1)

FORMAT

- ☒ All
- ☐ PDF (3)
- ☐ ZIP (1)


Specification and sample assessments (4)

[EXPAND ALL](#)

- Specification
- Notice
- Sample assessment material

SORT BY Latest

Specification



DOWNLOAD

PDF | 1.4 MB

First teaching: **September 2016**
First external assessment: **2018**

Our Pearson Edexcel International GCSE (9-1) Mathematics A specification and support materials have been developed with the help of teachers, higher education representatives and subject expert groups.

The qualification supports progression to further study, with up-to-date content reflecting the latest thinking in the subject. It is comparable to the UK reformed GCSEs in terms of the level of demand and assessment standards.

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Course materials

- > Specification and sample assessments (3)
- > Exam materials (297)
- > Teaching and learning materials (52)

Teaching support and training

- > New onscreen Mocks Service
- > Training sessions
- > Results support

Published resources

To support effective classroom delivery, we've developed a range of published resources for the new Pearson Edexcel International GCSE (9-1), with progression, relevance and support at their core.

[Learn more](#)

News and updates

[See more](#)

- Autumn teaching maths update | **12 October 2023**
- Getting Ready for Results Day | **18 July 2023**
- July teaching maths update | **4 July 2023**

Your Maths team

Nicola and Mark
Mathematics and Statistics

Email : teachingmaths@pearson.com

Phone : +44 (0) 344 463 2535
(Teaching Services team | Mon - Fri, 8am - 5pm GMT)

- > [Visit the customer support portal](#)
- > [Visit your maths community page](#)
- > [Sign up for Maths Emporium newsletter](#)

Useful documents

- [A guide to International GCSEs \(9-1\)](#) (PDF | 3.5 MB)
- [International GCSE \(9-1\) Mathematics guide](#) (PDF | 1.4 MB)
- [Pearson Edexcel International welcome pack](#) (PDF | 3.1 MB)

Support for Exam preparation and post results



- Free online results analysis tool for teachers.
- Provides a detailed breakdown of student performance in Pearson Edexcel exams.
- Identify topics and questions where the student could benefit from further learning and inform teaching strategies and approaches.
- Benchmark your school's performance against other Pearson Edexcel schools in your country.
- Not just a post-results tool: Mock exam results can also be fed into the system to produce analysis.
- Find student results analysis from their previous Pearson Edexcel school.
- ResultsPlus Direct gives your students access to their final grades and performance breakdown, wherever they are.
- Schools can sign up for free ResultsPlus account in just a few quick and easy steps:
<https://qualifications.pearson.com/en/support/Services/ResultsPlus.html>

ResultsPlus



1.
Student
takes exam
on paper



2.
Exam papers
scanned



3.
Examiners
mark papers
online



4.
Performance
reports
shared



- A free tool for teachers which helps you make quick homework assignments, topic tests and mock exams.
- Questions tagged against unit, topic and assessment objective or simply choose a whole past paper.
- Use existing mark schemes for accurate marking.
- Use examiner report for insight.
- Most recent exam content available sooner.
- Use the results to understand where students need more support, informing teaching strategies.

Access to Script (ATS) Online Portal

Access to Scripts (ATS) is a free online portal which allows teachers to immediately access electronically marked exam papers

Provides enhanced transparency and

- Offers transparent approach to marking process
- Provides better understanding of marking before requests for enquiries about results are made
- Provides excellent aid for teaching and preparing other cohorts for examinations by helping you to evaluate a student's performance on particular questions in relation to what they have been taught.

Available instantly from results day for all our examination series, for a defined window, you can view and download scripts which have been marked online free of charge from our Self-Service Portal.

For more information on ATS, and the post results windows, visit our post-results pages.



Additional Paid Resource

Resource	Planning, teaching and learning	Exam preparation and assessment	Results support
Curriculum-matched Student Books with ActiveBooks	✓	✓	
Teaching Hubs*	✓	✓	
Exam Practice Book*		✓	
Revision Guide*		✓	

Pearson published resources

Student Book

Edexcel International GCSE (9-1): Mathematics A
Student Book 1

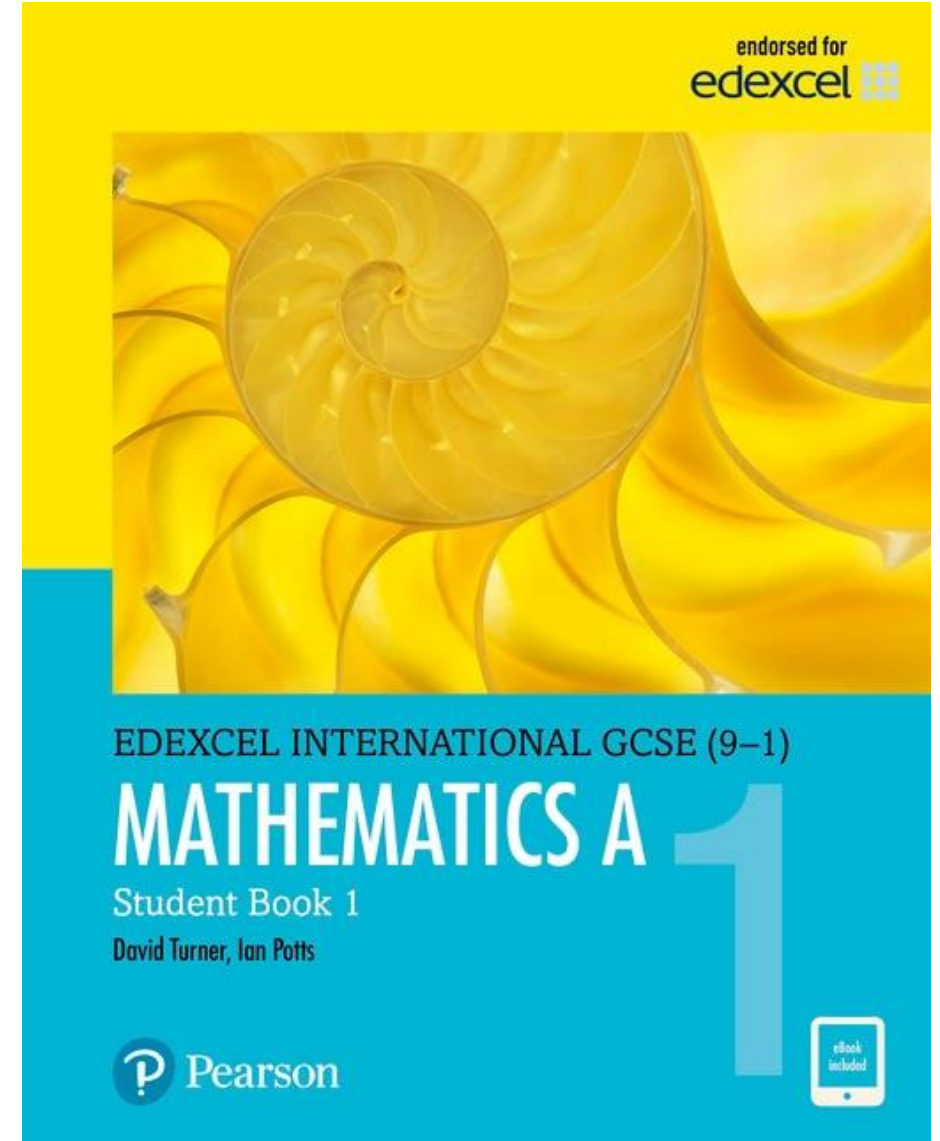
ISBN: 9780435181444

Edexcel International GCSE (9-1): Mathematics A
Student Book 2

ISBN: 9780435183059

For more information and access
to samples visit:

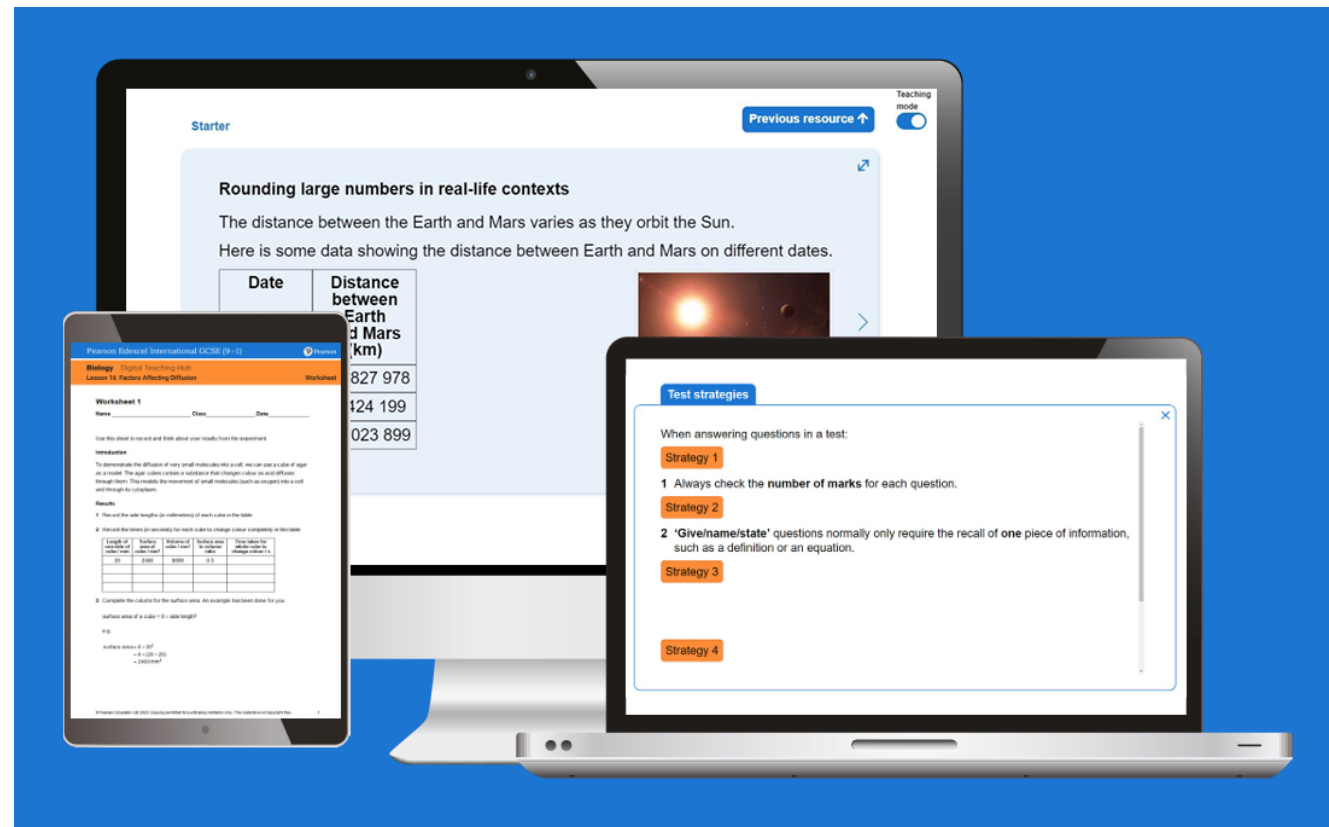
www.pearson.com/international-schools



International GCSE (9–1)

TeachingHubs

The new Teaching Hubs provide fully comprehensive planning and front-of-class guidance, along with exam-preparation resources and CPD support, to help you deliver your International GCSE lessons to a high standard – whether you are a specialist or non-specialist teacher.



Contact your dedicated Subject Partner

Subject Partner details

Your subject advisor **Mark Heslop**

Twitter: **@EmporiumMaths**

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Questions



Pearson