

Pearson Edexcel  
**International GCSE  
Mathematics**

Welcome to Pearson

4MA1-23IF2

First teaching in 2017, first assessment in 2019



# Agenda

Time	Session
10:00	Introductions and getting started
10:15	Session 1 – Welcome to Pearson – getting ready for delivery
11:30	Break
11:45	Session 2 – Assessment objectives and exemplars
12:45	Lunch
13:30	Session 2 – continued
14:30	Session 3 – Support from Pearson
16:00	End of training



# Aims & Objectives

- identify how the qualifications are devised
- review the content of the qualification
- explore how to plan the course and/or lessons
- understand the assessment of the qualification and how to prepare students
- identify the support available from Pearson
- network and share ideas with other teachers.



# Welcome to Pearson

# World-class Qualifications

All Edexcel qualifications are developed to meet Pearson's **World Class Qualification design principles**

Endorsement of educational **thought-leaders and assessment experts** from across the globe



Developed using an understanding and benchmarking of **all educational systems**

Qualifications that support young people to **develop the capabilities** they need to **progress** and prosper in their lives



# About Pearson Edexcel

Pearson is the world's leading learning company. Our mission is to help people make progress in their lives through learning – because we believe that learning opens up opportunities, creating fulfilling careers and better lives.

- **Qualifications:** our qualifications and assessments help to educate millions of people worldwide.
- **Support:** we provide innovative textbooks, curriculum materials, multimedia learning tools, IT platforms, professional development.
- **Impact:** At the core of everything we do is the desire to make a measurable impact on improving people's lives through learning.

Edexcel is part of Pearson Education and is the UK's largest awarding body.

- **Worldwide recognition:** over 150 years of international education experience, more than 3.4 million learners in 70+ countries. Over 9 million scripts marked annually, with exceptionally reliable results.



# Session 1

## Getting ready for delivery

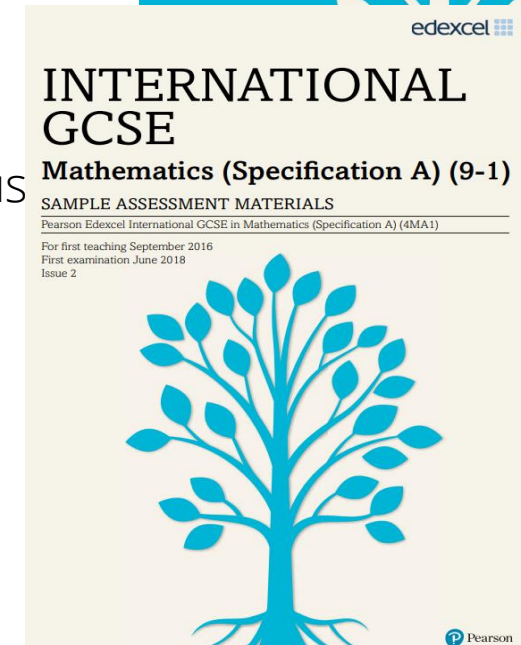
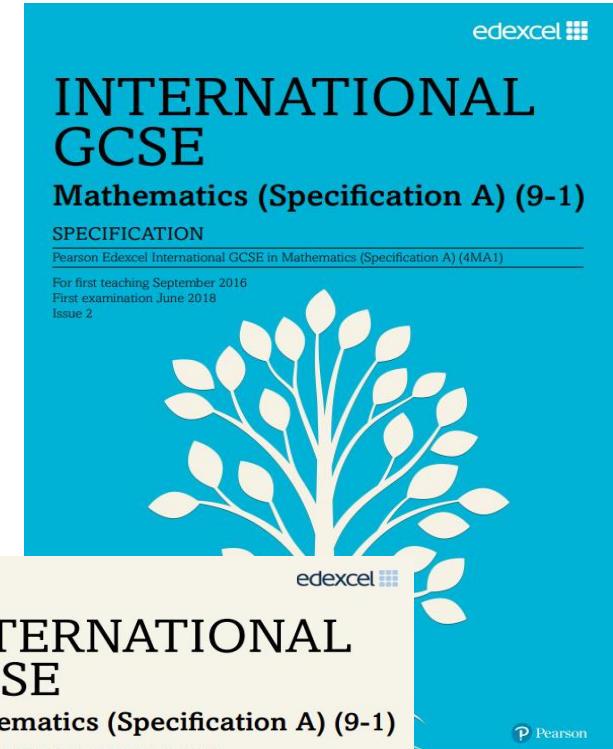
# What are specifications and SAMs?

## Specification

- A specification is the main document you need to teach the course.
- It outlines the aims of the course, the content you **MUST** cover and all the information you need about assessing your students.
- A copy of this document is in your pack and on our website.

## SAMs

- SAMs is short for Sample Assessment Materials. This document is just as important as the specification.
- The SAMs are examples of the question papers and mark schemes and show the question types and how they will be marked by the examiners.
- We base all of our future papers and assessments on these Sample Assessment Materials.







# Using the specification

## Content

### 1 4MA1 – Foundation and Higher tier

This is arranged as six broad topics arranged into sub-topics as appropriate. As a minimum all the content must be taught in each tier. A column for additional notes is included to clarify the detail of what must be covered.

### 2 4MB1 – Available only in higher tier

This is arranged as ten broad topics arranged into sub-topics as appropriate. As above, all the content must be taught. This is arranged into two columns; 'What students need to learn' and 'Notes'. The latter contains clarification of the detail in the specification as well as some examples.

# An example from the specification (4MB1)

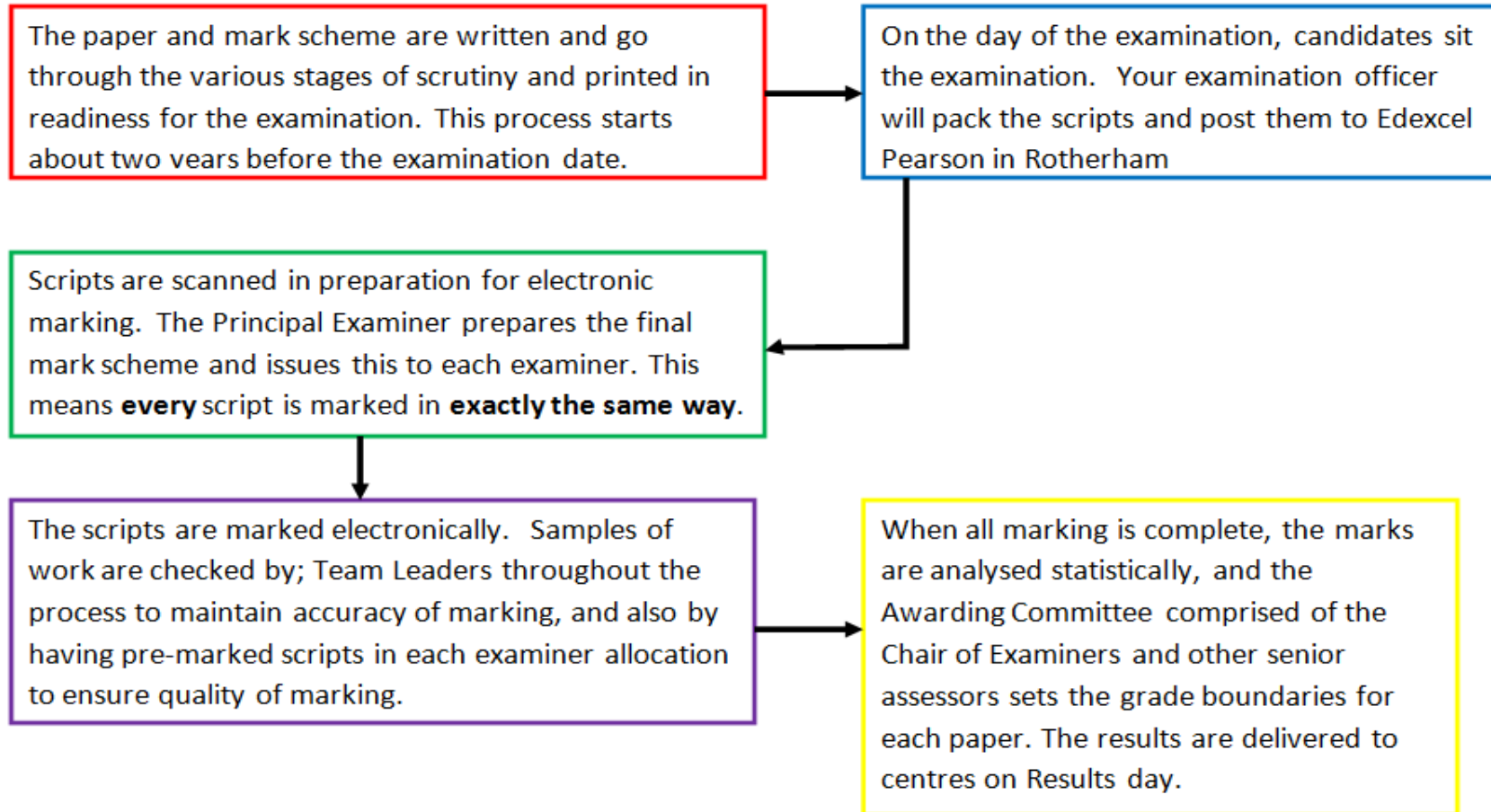
<b>D</b> Domain and range of a function	Questions will not be set on continuity, but students will be expected to recognise when parts of the domain need to be excluded (e.g. $x = 0$ must be excluded from the domain of the function $f$ where $f(x) = \frac{1}{x}$ )
<b>E</b> Composite functions	'fg' will mean 'do g first then f'
<b>F</b> Inverse functions	Finding the inverse of a function
<b>G</b> Variation, direct and indirect proportion	To include only the following: $y \propto x, y \propto \frac{1}{x}$ $y \propto x^2, y \propto \frac{1}{x^2}$ $y \propto x^3, y \propto \frac{1}{x^3}$ $y \propto \sqrt{x}, y \propto \frac{1}{\sqrt{x}}$
<b>H</b> Rectangular Cartesian co-ordinates	

This is the content that must be taught.

This is an example.

All possibilities listed here.

# The flow chart of the complete assessment process





# Content overview

## 4MA1

# Overview of the specification 4MA1

## Paper 1

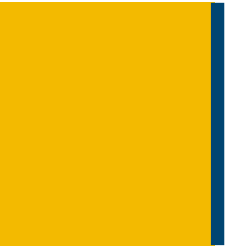
- Externally assessed
- Availability –  
November and June

50% of the total International GCSE

## Paper 2

- Externally assessed
- Availability –  
November and June

50% of the total International GCSE

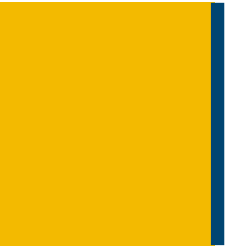


# Paper 1F and 2F – Foundation Tier

Assesses **all the content** in Foundation tier specification.

Questions may come from any topic area across the specification (including questions that address more than one topic).

1. Numbers and the number system
2. Equations, formulae and identities
3. Sequences, functions and graphs
4. Geometry and trigonometry
5. Vectors and transformation geometry
6. Statistics and probability



# Paper 1H and 2H – Higher Tier

Assesses **all the content** in the Higher tier specification.

Questions may come from any topic area across the specification (including questions that address more than one topic).

1. Numbers and the number system
2. Equations, formulae and identities
3. Sequences, functions and graphs
4. Geometry and trigonometry
5. Vectors and transformation geometry
6. Statistics and probability

# Problem solving

Paper	Problem solving	Reasoning, interpretation and reasoning
Foundation (1F and 2F)	25%	15%
Higher (3H and 4H)	30%	20%





# Content overview

## 4MB1

# Overview of the specification 4MB1

## Paper 1

- Externally assessed
- Availability –  
November and June

33 $\frac{1}{3}$  % of the total International  
GCSE

## Paper 2

- Externally assessed
- Availability –  
November and June

66 $\frac{2}{3}$  % of the total International  
GCSE



# Paper 1 and Paper 2

Assesses **all the content** in the specification.

Questions may come from any topic area across the specification (including questions that address more than one topic).

1. Number
2. Sets
3. Algebra
4. Functions
5. Matrices
6. Geometry
7. Mensuration
8. Vectors and transformation geometry
9. Trigonometry
10. Statistics and Probability

# Problem solving and reasoning

Paper	Problem solving	Reasoning, interpretation and reasoning
Paper 1 and 2	30%	20%

The image features a solid yellow background. A white rectangular area is positioned in the upper-left quadrant. To the left of this white area, a thin, dark blue vertical line extends from the top to the bottom of the white rectangle's height.

# Examiner reports



# Examiner reports

- The importance of reading examiner reports when the examination results are published cannot be understated.
- They highlight the areas for development that centres need to concentrate on and some topics receive frequent mention in these reports.
- The following slides show the main points from the introductory paragraphs as well as examples of detailed reports on questions.



4MA1



# What our examiners have noticed Foundation Tier

The following are extracts from the June 2019 Examiner reports (1)

Students who were well prepared for this paper made a good attempt at the majority of the questions. The questions involving multi-stage calculations, for instance question 8 and question 17, were often not completed by students who generally showed a lack of understanding on how to proceed.

On the whole students tended to show their working but for some students the need to show all stages must be stressed to enable them to maximise their mark gaining potential.

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Working was frequently shown and easy to follow through. There were some instances where students failed to read the question properly. For example, In question 16(a) students regularly found 40% of  $\frac{1}{2}$  of the books while in 16(b) some students worked out the percentage of 15 and did not realise this was a question on reverse percentages.

A striking weakness in students was the method of solving simultaneous equations. On the whole, problem solving questions and those assessing mathematical reasoning were not tackled well; particular question 21.



# What our examiners have noticed

## Foundation Tier

The following are extracts from the June 2019 Examiner reports (2)

Students who were well prepared for this paper were able to gain a good measure of success on the majority of questions. A feature of the new specification is problem-solving questions. These tend to be more open-ended questions with less direction and prompts given at the outset. They frequently include the phrase 'explain your answer' or ask for some other justification of the answer. Students often lose marks here through either ignoring this aspect of the question or through the brevity of their answers. Q2(d), Q11 and Q14 were good examples of this style of problem solving questions. Many candidates here did necessary calculations but failed to reach a conclusion.

Note these sentences very carefully

Note the importance of writing a conclusion in problem solving questions.

The following slides show a question and the detailed report on that question

# June 2109 Paper 1 Question 8

The diagram shows two triangles,  $CDB$  and  $BDA$ .

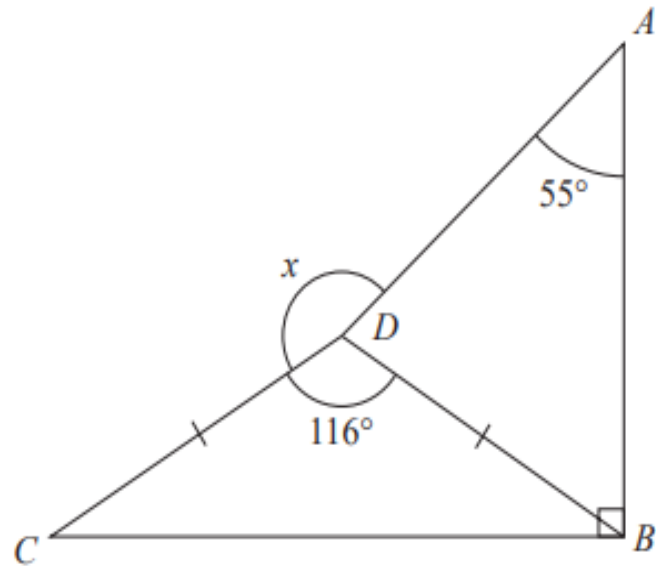


Diagram **NOT**  
accurately drawn

$$DC = DB$$

$$\text{Angle } ABC = 90^\circ$$

$$\text{Angle } CDB = 116^\circ$$

$$\text{Angle } DAB = 55^\circ$$

Work out the size of the angle marked  $x$ .

Give a reason for each stage of your working.

This is a  
reasoning  
question.

# Question 8 – Examiner Report

Note the key points raised:

## Question 8

There were a high number of responses that showed little understanding of how to proceed in this multi-step question to find the size of an angle on a diagram. Some basic misconceptions appeared regularly, such as assuming that the line  $DB$  dissected angle  $ABC$  and angle  $ADC$ . Working that developed from this was inevitably flawed. Encouragingly there were also many students who competently reached the correct answer for the size of the angle. Of these, a significant number lost one or both of the remaining two marks, as they failed to give any reasons or gave reasons that were not sufficient for example, "a triangle is  $180^\circ$ " could not gain credit; there needs to be some kind of reference to the *angles* in the triangle adding up to  $180^\circ$ . Likewise, "angles in a circle are  $360^\circ$ " did not receive credit as we needed to see this expressed with reference to the angles at a *point* adding up to  $360^\circ$  - this and the omission of any mention of isosceles were the main reasons for the small number of students being awarded the full five marks. Students should also be aware that showing their working, however detailed, is not the same as giving reasons.

Making erroneous assumptions

Incorrect, incomplete or no reasons given

Showing working instead of mathematical reasons is a frequently recurring theme



# What our examiners have noticed Higher Tier

The following are extracts from the June 2019 Examiner reports

Some students are over reliant on their calculators and when asked to show full working are unable to show all the steps involved. They also do not know the full working of their calculator and, for instance, the need to use brackets round a negative number in order to square it, such as for completing the table for the quadrature graph.

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There are still some students who do not show their complete method and centres would benefit from spending time with future cohorts practising showing all the steps to their solutions.

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Completing the square, probability, vectors, surds and simultaneous equations (one quadratic and one linear) seemed to be a weakness for many students. Operations involving negative numbers were also a weakness.



4MB1

# What our examiners have noticed - from Paper 1 [Home and Regional]

The following are extracts from the June 2019 Examiner reports

In general, students should be encouraged to identify the number of marks available for each part of a question and allocate a proportionate amount of time to each part of the question. In addition, students should also be advised to read the demands of the question very carefully before attempting to answer.

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To enhance performance in future series, centres should focus their students' attention on the following topics:

- Reasons in geometric problems
- Questions that involve the demand to show all working (most notably questions 7, 20 and 21)
- Coordinate geometry
- Histograms
- Unstructured trigonometry questions
- Application of bounds
- Questions requiring algebraic proof

These are all questions that use the command '**show**'



Discuss with a neighbor

Discuss; what are the implications for teaching and learning arising from the Examiners' Reports?



# Planning the course and lessons

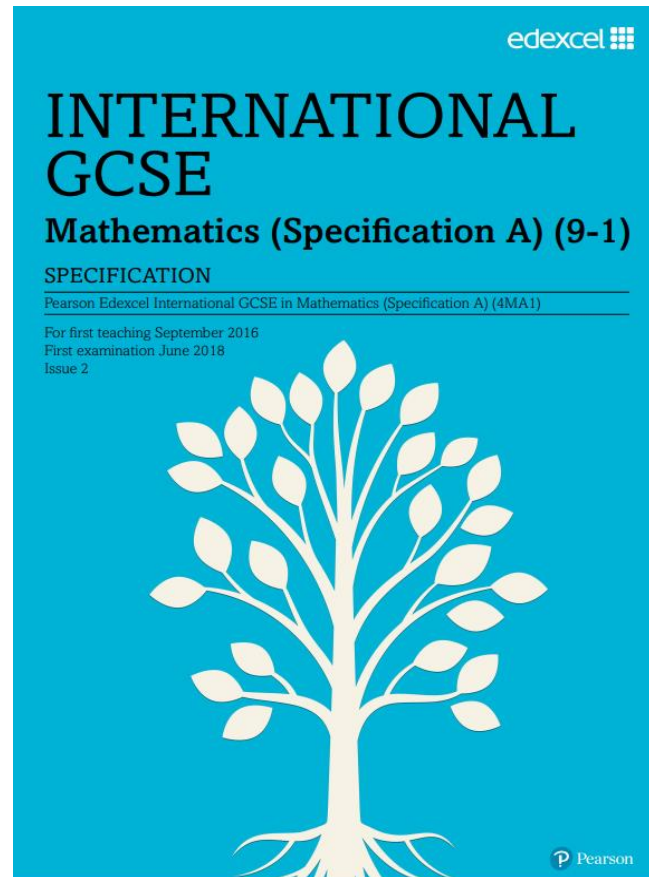
How do I make sure I cover all the content?

- Specification
- Year planners
- Lesson Plans
- Schemes of Work for both 4MA1 and 4MB1 published in Word so that they can be adapted to your school.



# How do I make sure I cover all the content?

## Specification



# How do I make sure I cover all the content?

## Year Planner

This is the module planner from the Scheme of Work – International GCSE mathematics Specification A

Unit	Title	Specification Reference	Estimated teaching hours
20	Polygons	<b>4.2A</b> recognise and give the names of polygons	5
		<b>4.2D</b> understand the term 'regular polygon' and calculate interior and exterior angles of regular polygons	
		<b>4.2E</b> understand and use the angle sum of polygons	
21	Compound measures	<b>4.4F</b> understand and use the relationship between average speed, distance and time	5
		<b>4.4G</b> use compound measure such as speed, density and pressure	
22	Perimeter, area and volume	<b>4.9B</b> find the perimeter of shapes made from triangles and rectangles	6
		<b>4.9C</b> find the area of simple shapes using the formulae for the areas of triangles and rectangles	
		<b>4.9D</b> find the area of parallelograms and trapezia	
		<b>4.10C</b> find the surface area of simple shapes using the area formulae for triangles and rectangles	
		<b>4.10E</b> find the volume of prisms, including cuboids and cylinders, using an appropriate formula	
23	Circles and cylinders	<b>4.6A</b> recognise the terms 'centre', 'radius', 'chord', 'diameter', 'circumference', 'tangent', 'arc', 'sector' and 'segment' of a circle	6
		<b>4.6B</b> understand chord and tangent properties of circles	
		<b>4.9E</b> find circumferences and areas of circles using relevant formulae; find perimeters and areas of semicircles	
		<b>4.10D</b> find the surface area of a cylinder	
		<b>4.10E</b> find the volume of prisms, including cuboids and cylinders, using an appropriate formula	

# An example of a lesson plan from the Scheme of Work

Possible success criteria

Problem solving and reasoning are embedded

Common misconceptions

## 7. Degree of accuracy

Teaching time

3-5 hours

### OBJECTIVES

1 J	e.g. identify upper and lower bounds where values are given to a degree of accuracy
	solve problems using upper and lower bounds where values are given to a degree of accuracy

### POSSIBLE SUCCESS CRITERIA

Round 16,000 people to the nearest 1000

Round 1100 g to 1 significant figure.

Work out the upper and lower bounds of a formula where all terms are given to 1 decimal place.

Be able to justify that measurements to the nearest whole unit may be inaccurate by up to one half in either direction.

### OPPORTUNITIES FOR REASONING/PROBLEM SOLVING

This sub-unit provides many opportunities for students to evaluate their answers and provide counterarguments in mathematical and real-life contexts, in addition to requiring them to understand the implications of rounding their answers.

### COMMON MISCONCEPTIONS

Students readily accept the rounding for lower bounds, but take some convincing in relation to upper bounds.

### NOTES

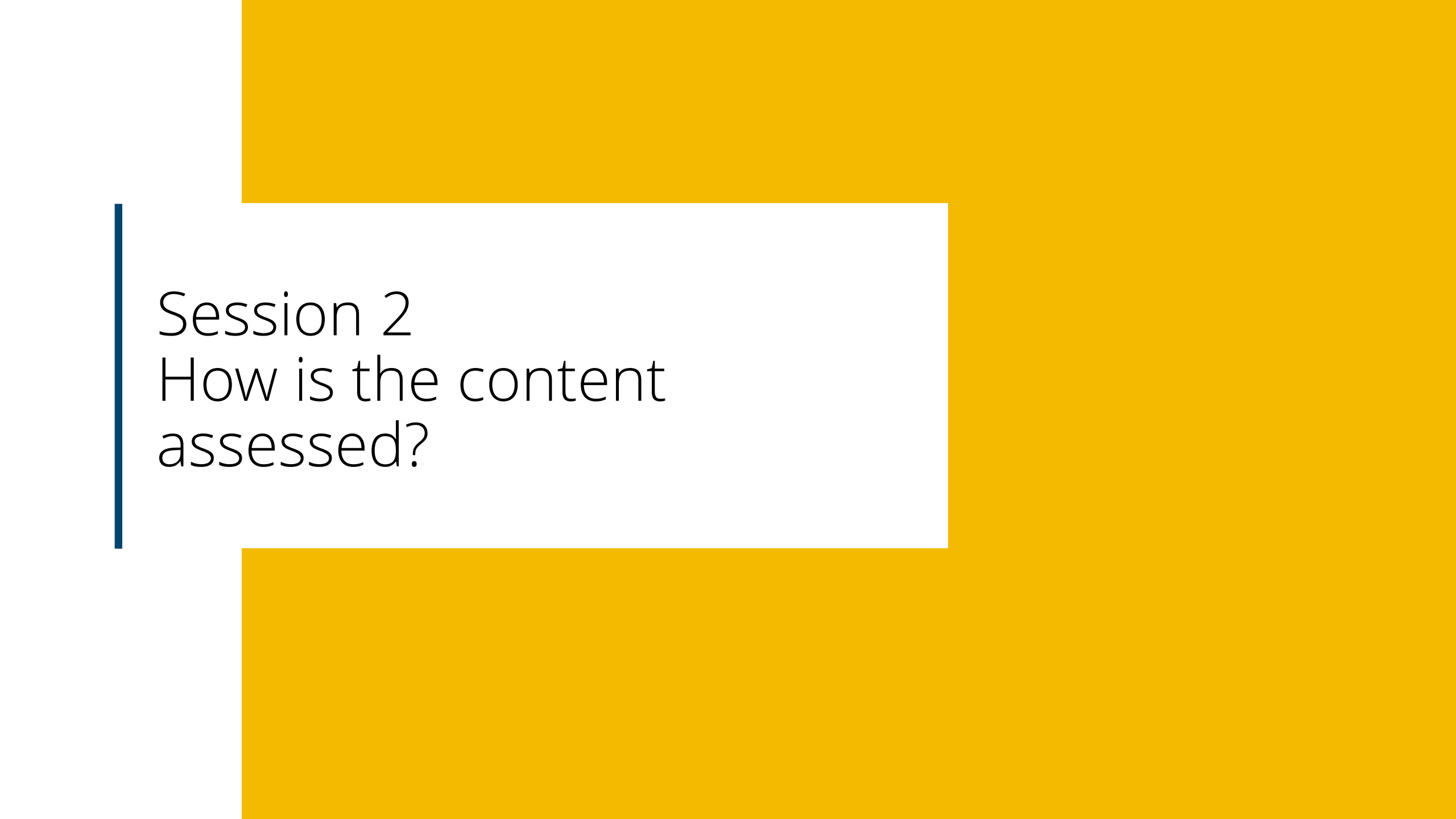
Students should use 'half a unit above' and 'half a unit below' to find upper and lower bounds. Encourage use of a number line when introducing the concept.

EXAMPLE QUESTIONS FROM SAMs: 01 Q 8

# Activity 1 – Lesson planning

Discuss on your table and be prepared to feedback to the whole group,

1. How do you plan your lessons in mathematics? Do you for example, have a common lesson structure as a starting point?
2. How do you ensure that you have covered the specification?
3. What concerns do you have about planning this course?
4. Are there ways you might need to adapt your method(s) of lesson planning to deliver this specification?



## Session 2

How is the content  
assessed?



4MA1



# What are the assessment objectives?

## 4MA1

A01 - Demonstrate knowledge of facts, techniques and relationships in:

- Numbers and the number system
- Equations, formulae and identities
- Sequences, functions and graphs

(57–63%)

A02 - Demonstrate knowledge of facts, techniques and relationships in:

- Geometry
- Vectors and transformation geometry

(22–28%)

A03 - Demonstrate knowledge of facts, techniques and relationships in:

- Statistics and probability

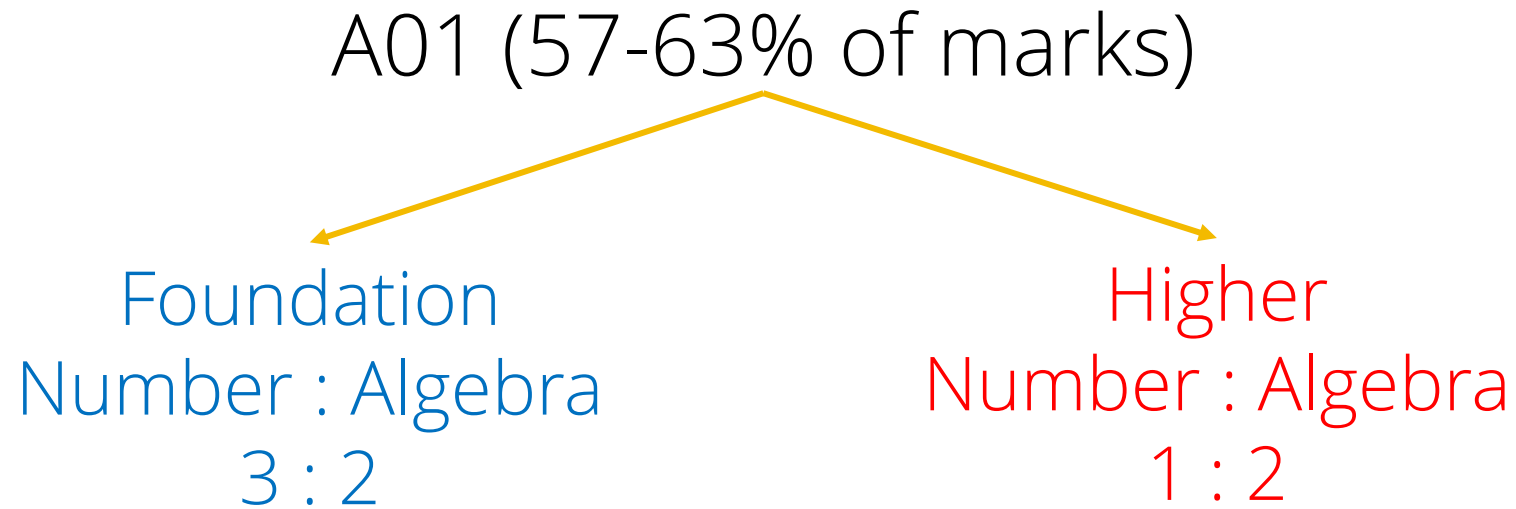
(12–18%)

# Relationship of assessment objectives to units

Unit number 4MA1	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%



# A01 Split for Foundation and Higher



This split could be a factor in helping to decide whether a student is a Foundation or Higher candidate.

The greater emphasis on Algebra is preparation for progression to A level.

# Paper 1F and 2F – Foundation Tier

Content	Assessment
<p>Assesses <b>all the content</b> in Foundation tier specification.</p> <p>Questions may come from any topic area from the Assessment Objectives across the specification (including questions that address more than one topic).</p>	<ul style="list-style-type: none"><li>• Each paper is assessed through a 2-hour examination set and marked by Pearson.</li><li>• Each paper is weighted at 50% of the qualification.</li><li>• Each paper will assess the full range of targeted grades at Foundation Tier (1–5).</li><li>• The paper is ramped in difficulty, so the Grade 1 questions are at the beginning of the paper and the grade 5 questions at the end.</li><li>• The paper will be distributed evenly over all grades (20% per grade).</li><li>• The total number of marks is 100.</li><li>• A calculator is allowed in both papers.</li></ul>

# Paper 1H and 2H – Higher Tier

Content	Assessment
<p>Assesses <b>all the content</b> in the Higher tier specification.</p> <p>Questions may come from any topic area from the Assessment Objectives across the specification (including questions that address more than one topic).</p>	<ul style="list-style-type: none"><li>• Each paper is assessed through a 2-hour examination set and marked by Pearson.</li><li>• Each paper is weighted at 50% of the qualification.</li><li>• Each paper will assess the full range of targeted grades at Higher Tier (4–9).</li><li>• The paper is ramped in difficulty, so the Grade 4 questions are at the beginning of the paper and the grade 9 questions at the end.</li><li>• Approximately 40% of the paper will be distributed evenly over grades 4 and 5 and approximately 60 % of the marks distributed evenly over grades 6–9.</li><li>• The total number of marks is 100.</li><li>• A calculator is allowed in both papers.</li></ul>



# Mark allocation of grades

## 4MA1

### Higher Tier

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

### Foundation tier

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



4MB1

# What are the assessment objectives?

## 4MB1

A01 - Demonstrate knowledge of facts, techniques and relationships in:

- Numbers and the number system
- Equations, formulae and identities
- Sequences, functions and graphs

(57–63%)

A02 - Demonstrate knowledge of facts, techniques and relationships in:

- Geometry
- Vectors and transformation geometry

(22–28%)

A03 - Demonstrate knowledge of facts, techniques and relationships in:

- Statistics and probability

(12–18%)

# Relationship of assessment objectives to units

Unit number 4MB1	Assessment objective		
	AO1	AO2	AO3
Paper 1	28.5–31.5%	11–14%	6–9%
Paper 2	28.5–31.5%	11–14%	6–9%
Total for International GCSE	57–63%	22–28%	12–18%

# Paper 1

## Content

Assesses **all the content** in the specification.

Questions may come from any topic area from the Assessment Objectives across the specification (including questions that address more than one topic).

## Assessment

This paper:

- Is assessed through a 1-hour 30-minute examination set and marked by Pearson.
- Is weighted at  $33\frac{1}{3}$  % of the qualification.
- Targets at grades 4–9.
- Consists of around 26–30 questions with varying mark allocations which will be stated.
- The total number of marks is 100.
- A calculator is allowed.



# Paper 2

## Content

Assesses **all the content** in the specification.

Questions may come from any topic area from the Assessment Objectives across the specification (including questions that address more than one topic).

## Assessment

This paper:

- Is assessed through a 2-hour 30-minute examination set and marked by Pearson.
- Is weighted at  $66\frac{2}{3}\%$  of the qualification.
- Targets at grades 4–9.
- Approximately 40% of the paper will be distributed evenly over grades 4 and 5 and approximately 60% of the marks distributed evenly over grades 6–9.
- Consists of around 11 – 12 questions with varying mark allocations which will be stated .
- The total number of marks is 100.
- A calculator is allowed.



# Mark allocation of grades

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



# What types of questions are asked?

## 4MA1

- Short answer questions
- Extended response questions which generally have a maximum of 6 marks
- Problem solving and reasoning questions

## 4MB1

- Short answer questions (in Paper 1)
- Extended response questions which generally have up to 10–16 marks
- Problem solving and reasoning questions



# Short response questions

# SAMs 4MA1 Foundation Paper 1 Question 2

2 (a) Write 64% as a fraction.

Give your fraction in its simplest form.

The command word 'write' means no calculation is involved.

(b) Write 9% as a decimal.

(c) Work out  $\frac{1}{6}$  of 84 kg.

The command words 'work out' means a calculation is required.

(2)

(1)

(1)

kg

The mark allocation is very important. In this case one mark is awarded for writing 64% as 64/100. The second mark is awarded for the simplified answer of 16/25

(Total for Question 2 is 4 marks)

# SAMs 4MA1 Foundation Paper 1 Question 22

22

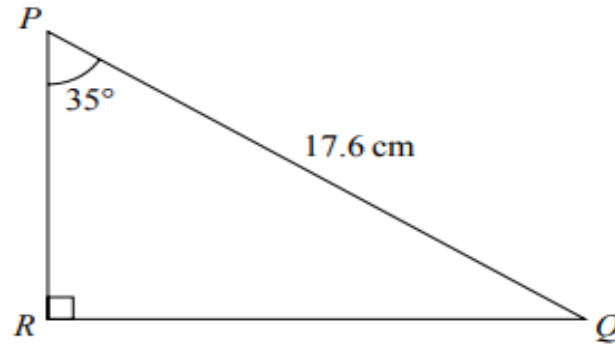


Diagram **NOT**  
accurately drawn

Calculate the length of  $PR$ .  
Give your answer correct to 3 significant figures.

Note the rounding  
requirements very  
carefully.

Once again, note the  
allocation of marks.  
3 marks implies that  
calculations/working  
out is involved and  
therefore all  
methods must be  
shown clearly.

.....cm

(Total for Question 22 is 3 marks)

# SAMS 4MB1 Paper 1 Question 3

3 Solve  $\frac{2x+5}{4} = 1$

There are 2 marks allocated for this question. It is the higher demand 4MB1 paper, but once again, even though it is possible to 'work it out in your head' fairly easily, full working should always be shown.

$x =$  .....

(Total for Question 3 is 2 marks)



# Extended response questions



# SAMs 4MA1 Paper 1 Higher Question 22

22 (a) Write  $2x^2 - 8x + 9$  in the form  $a(x + b)^2 + c$

This is a challenging question on completing the square.

Note the use of the phrase 'Hence, or otherwise'. **Hence** is telling the candidate that they should be using the result from part (a) to answer part (b).

If a candidate uses calculus, for example, then provided it is correct, full credit will be given, but the allocation of just one mark is also a hint that the answer can be 'written down'. This would be **otherwise**.

(3)

(b) Hence, or otherwise, explain why the graph of the curve with equation  $y = 2x^2 - 8x + 9 = 0$  does not intersect the  $x$ -axis.

(1)

# SAMs 4MB1 Paper 2

## Question 10

Note the very simple start. The question progresses through the grades of difficulty.

Part (e) is Grade 9

**10** The vertices of triangle  $A$  are the points with coordinates  $(2, 6)$ ,  $(4, 2)$  and  $(6, 2)$ .

(a) On the grid opposite, draw and label triangle  $A$ .

(1)

Triangle  $B$  is the image of triangle  $A$  under a reflection in the line with equation  $y = -1$

(b) On the grid, draw and label the line with equation  $y = -1$

(1)

(c) On the grid, draw and label triangle  $B$ .

(1)

Triangle  $B$  is transformed to triangle  $C$  by the enlargement with centre  $(0, -2)$  and scale factor  $-\frac{1}{2}$

(d) On the grid, draw and label triangle  $C$ .

(3)

Triangle  $C$  is transformed to triangle  $D$  under the transformation with matrix  $\mathbf{M}$  where

$$\mathbf{M} = \begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$$

(e) On the grid, draw and label triangle  $D$ .

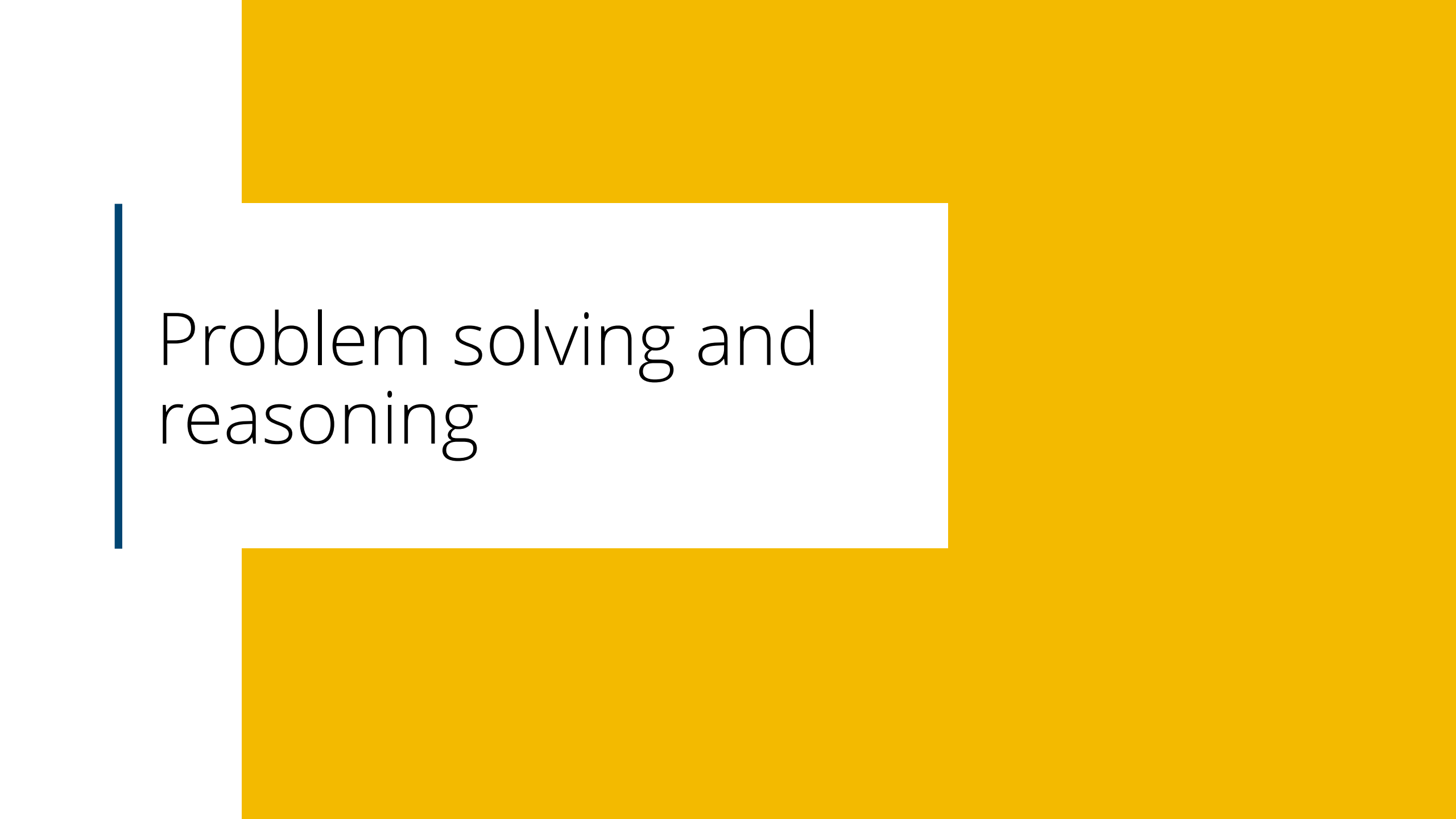
(3)

(f) Describe fully the transformation with matrix  $\mathbf{M}$ .

(2)

(g) Describe fully the **single** transformation that maps triangle  $D$  onto triangle  $A$ .

(3)



# Problem solving and reasoning

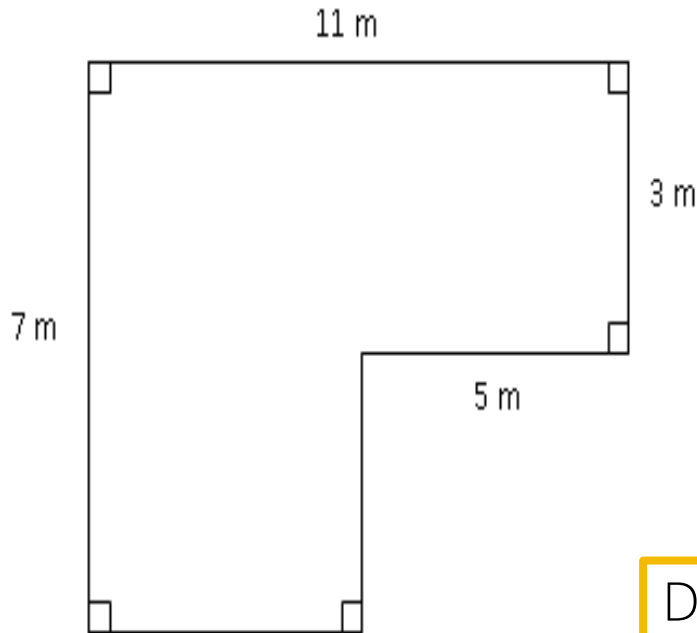


# Embedding Problem Solving in International GCSE Mathematics

- Problem solving now forms a large part of the International GCSE syllabus.
- Problem solving adds relevance to students studying mathematics.
- Candidates may be expected to solve real-world problems or mathematical problems that require mathematical skills and a series of mathematical steps in order to solve them.
- The following slides demonstrate the two types of questions that candidates may be asked.

## Activity 2 - A 'real-world' problem

A 'non-mathematical' problem



The diagram shows the floor plan of a room in Kate's house.

Kate is going to cover the floor with tiles. She is going to buy some packs of tiles.

The tiles in each pack of tiles cover  $2 \text{ m}^2$  of floor and can be purchased in whole packs only. Each pack of tiles costs £24.80

Work out how much it will cost Kate to buy the packs of tiles she needs.

Discuss;

- What steps does a candidate need to take to solve this problem?
- How would you teach your students to tackle this type of question?

## Activity 3

Question 25 from 4MA1 SAMs Paper 1F and also Question 10 from 4MA1 SAMs Paper 1H (Common question)

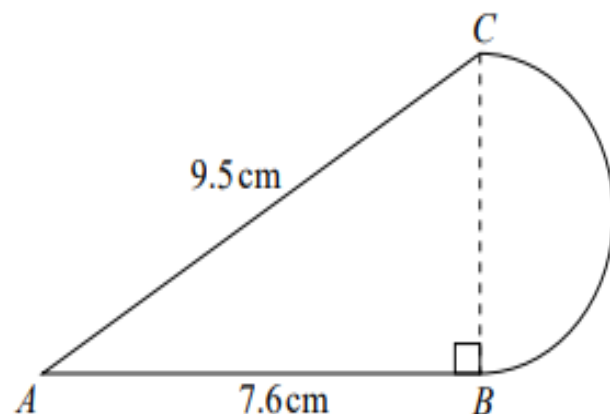


Diagram **NOT**  
accurately drawn

A 'mathematical' problem

The diagram shows a shape made from triangle  $ABC$  and a semicircle with diameter  $BC$ . Triangle  $ABC$  is right-angled at  $B$ .

$AB = 7.6\text{ cm}$  and  $AC = 9.5\text{ cm}$ .

Calculate the area of the shape.

Give your answer correct to 3 significant figures.

Discuss;

- What makes this a problem solving question?

# Embedding Reasoning Skills in International GCSE Mathematics

Reasoning also forms a part of the International GCSE syllabus. Reasoning skills relate to geometrical and algebraic proof type questions.

The following question is a typical example from Higher tier GCSE:

Prove algebraically that the difference between the squares of any two consecutive numbers is equal to the sum of these two numbers.

(4)

Solution

Let the two consecutive number be  $n$  and  $n+1$

Difference of squares:  $(n+1)^2 - n^2 = n^2 + 2n + 1 - n^2 = 2n + 1$

Sum of the numbers:  $(n+1) + n = 2n + 1$

Conclusion: Difference = Sum hence shown

Two crucial points to note:

- Full working must always be shown in a proof.
- A proof must have a conclusion.

# 4MA1 Foundation tier SAMs Paper 1 Question 9

$ABC$  is an isosceles triangle.

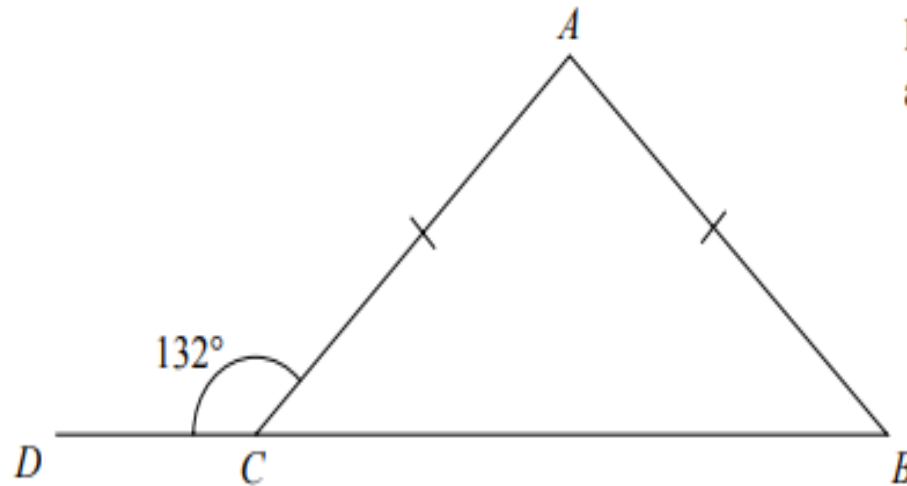


Diagram **NOT**  
accurately drawn

$DCB$  is a straight line.

$AC = AB$ .

Angle  $DCA = 132^\circ$

Work out the size of angle  $CAB$ .

Give a reason for each stage in your working.

Note the requirement to give reasons at each stage of working. The reasons must be mathematical reasons. For example;

Step 1

Angle  $ACB = 180^\circ - 132^\circ = 48^\circ$  (This is a calculation)

Angles on a straight line sum to  $180^\circ$  (This is the reason)



## Activity 4

### 4MB1 SAMs Paper 1 Question 26

26 (a) Use the factor theorem to show that  $(2x + 3)$  is a factor of  $2x^3 - 3x^2 - 17x - 12$

Note the requirement 'use factor theorem' meaning that using algebraic division (though a perfectly valid method) is not acceptable and will gain no credit in part (a).

The requirement '**show**' means that full working is required – in this case a clear substitution of  $-3/2$  for  $x$  in the expression is required.

(2)

(b) Hence, factorise completely  $2x^3 - 3x^2 - 17x - 12$



# What are mark schemes?

- These are the answers to the questions.
- They often give a range of responses a student might give.
- They can show indicative content to the markers.
- They also advise markers of common errors.
- Examiners use the mark scheme **positively** and look to reward marks for correct work seen rather than penalise candidates for what is not seen.

# What types of marks are awarded?

**M marks** – are Method marks. In the case of a single method mark, the whole method must be complete for the award of the mark.

**A marks** – are Accuracy marks. This mark is awarded for the correct answer. The A mark is, however, dependent on the M mark being awarded. If the correct answer comes from an incorrect method, in which case the M mark is not awarded, then the A mark will also not be awarded.

**B marks** – are independent marks. They are awarded for a correct answer seen. These marks are often used in questions with the command 'write down', where the answer is not the result of a calculation or method.

## Some other abbreviations used in the mark scheme

The prefix **d** is sometimes used before an M mark. E.g. dM

This means that the subsequent M mark is dependent on a preceding mark being awarded.

**isw** – means ‘ignore subsequent working’, although this can mean ignore any working on the page that does not contradict correct working.

For example;

**Factorise**      $x^2 + 5x + 4$

**Solution**      $(x+4)(x+1) = 0 \Rightarrow x = -4, x = -1$

The question states factorise and the candidate has factorised the 3 term quadratic. They have gone on to solve an equation = 0 which was not required. In this kind of instance we could **isw** the working after the correct factorisation has been seen.

**bod** – means ‘benefit of doubt’ although this is seldom used. There needs to be some compelling evidence in the candidates’ work to give this.

# What is in a mark scheme?

Here is the mark scheme for Question 22 SAMs 4MA1 seen on slide 58

22	a	$2(x^2 - 4x) + 9$ or $2(x^2 - 4x + \frac{9}{2})$ $2((x - 2)^2 - 2^2) + 9$ or $2((x - 2)^2 - 2^2 + \frac{9}{2})$	<div>Alternative methods</div>		AO1	<div>M1 First M mark is for factorising the term in x squared</div> <div>M1 The second M mark is for completing the square.</div> <div>A1 The A mark is for the correct answer in the required form only.</div>
	b		$2(x - 2)^2 + 1$ explanation	3 1	AO1	<div>B1 E.g. Because minimum is at (2, 1)</div>

This is an example of a B mark, where the answer can just be 'written down'. If a candidate used calculus, this would also gain this mark if the work was correct.

## General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme.

Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.

- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Examiners mark scripts uniformly to exactly the same standard, just as if every script was marked by one person (the Principal Examiner)



# How do they all fit together?

- Senior examiners will use the content and assessment objectives to devise the questions and the mark schemes.
- The type of questions will not only satisfy the percentage of content in the assessment objectives, but also the percentage of marks for each grade.
- The following two slides show a question and its mark scheme.

# Paper 1F June 2019 Question 11

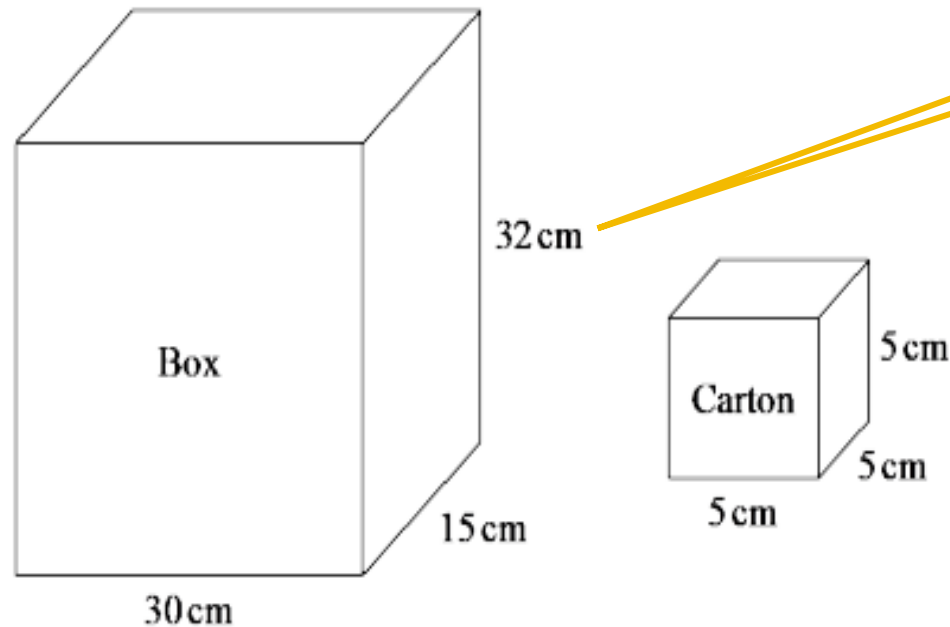


Diagram **NOT**  
accurately drawn

A wooden box measures 30 cm by 15 cm by 32 cm.  
The box has a lid.

A carton measures 5 cm by 5 cm by 5 cm.

James has 110 cartons.

He wants to put all these cartons in the box and be able to shut the lid.

Can James put all 110 cartons in the box and shut the lid?  
Show your working clearly.



# Paper 1F June 2018 Question 11 ms

11	$32 \div 5 (= 6.4 \text{ or } 6) \text{ or } 15 \div 5 (=3)$ $\text{or } 30 \div 5 (=6)$  $"6" \times "3" \times "6" (=108)$	No with 108	3	M1  M1 integer values must be used  A1 SC: If no marks awarded then award B1 for an answer of 'yes' with 115(.2) <b>OR</b> 'yes' and 14400 and 13750
----	---------------------------------------------------------------------------------------------------------------------------------------	-------------	---	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Total  
marks

This is the column  
showing the  
required working

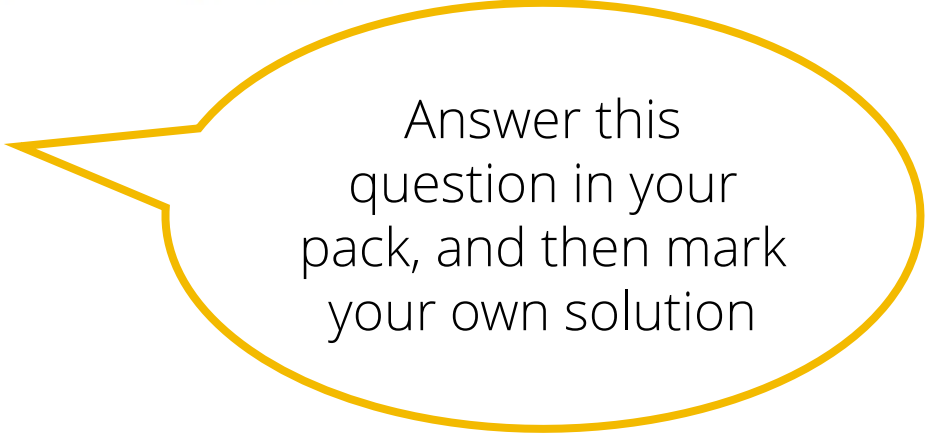
The  
answer  
column

The allocation of  
marks and additional  
guidance

## Example of an examination question – Question 26 from SAMs Paper 1 4MB1

**26** (a) Use the factor theorem to show that  $(2x + 3)$  is a factor of  $2x^3 - 3x^2 - 17x - 12$

(b) Hence, factorise completely  $2x^3 - 3x^2 - 17x - 12$



Answer this question in your pack, and then mark your own solution

Using the mark scheme on the next slide, mark your own work.

# Example of external assessment – Question 26 from SAMs Paper 1 4MB1

		Method	Step	Step	Step	Step
26(a)	$2 \times (-1.5)^3 - 3 \times (-1.5)^2 - 17 \times (-1.5) - 12$ (substitute)		M1	1.3		
		$= 0$	A1		2	
26(b)	$x^2 - 3x$		M1			
		$x^2 - 3x - 4$	A1			
	$(x-4)(x+1)$ (solving trinomial quadratic)		M1 INDEP			
		$(2x+3)(x-4)(x+1)$	A1		4	6

This means that the M mark is awarded for a **minimum** of these two terms seen. Any method is acceptable.

The factorised expression seen **complete** on one line


# Activity 5

## The exam paper

Candidates must answer **every question**. It is unfortunately all too common that some candidates leave questions completely unanswered.

Note this very important bullet point.

Please check the examination details below before entering your candidate information

Candidate surname		Other names	
Pearson Edexcel		Centre Number	Candidate Number
International GCSE		<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
<b>Tuesday 21 May 2019</b>			
Morning (Time: 2 hours)		Paper Reference <b>4MA1/1F</b>	
<b>Mathematics A</b>			
<b>Level 1/2</b>			
<b>Paper 1F</b>			
<b>Foundation Tier</b>			
<b>You must have:</b> 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

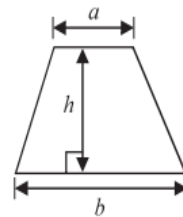
- Read each question carefully before you start to answer it.
- Check your answers if you have time at the end.

Discuss how much time should be allocated to each question

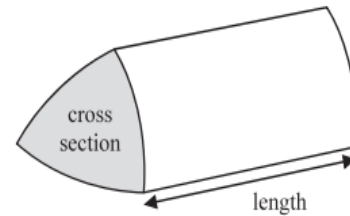
# Formulae 4MA1

Formulae sheet – Foundation Tier

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

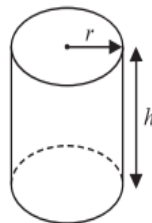


$$\text{Volume of prism} = \text{area of cross section} \times \text{length}$$



$$\text{Volume of cylinder} = \pi r^2 h$$

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



## International GCSE Mathematics Formulae sheet – Higher Tier

### Arithmetic series

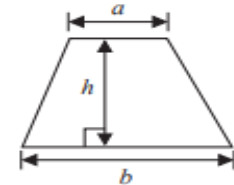
$$\text{Sum to } n \text{ terms, } S_n = \frac{n}{2} [2a + (n - 1)d]$$

### The quadratic equation

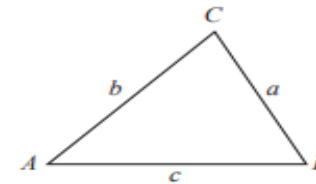
The solutions of  $ax^2 + bx + c = 0$  where  $a \neq 0$  are given by:

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

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



### Trigonometry



### In any triangle ABC

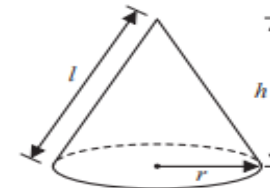
$$\text{Sine Rule } \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

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

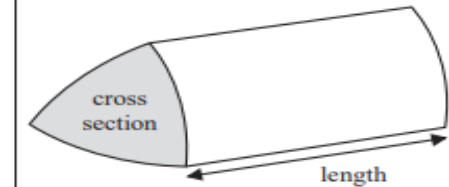
$$\text{Area of triangle} = \frac{1}{2}ab \sin C$$

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

$$\text{Curved surface area of cone} = \pi r l$$

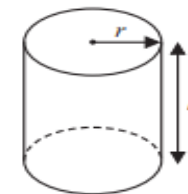


$$\text{Volume of prism} = \text{area of cross section} \times \text{length}$$



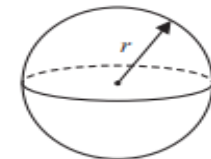
$$\text{Volume of cylinder} = \pi r^2 h$$

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



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

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



# Formulae 4MB1

## Paper 1

- Formulae are not given – candidates are expected to know the formulae they will need for this paper.

## Paper 2

- Any formulae that candidates are not expected to know (see the specification for a list of these) will be given.
- For example; Question 4 Paper 2 June 2019 – the inverse of a matrix is given at the end of the question.

$$\left[ \text{The inverse of matrix } \begin{pmatrix} a & b \\ c & d \end{pmatrix} \text{ is } \frac{1}{ad - bc} \begin{pmatrix} d & -b \\ -c & a \end{pmatrix} \right]$$

# Activity 6

## Marking activity (1)

The following two questions with their mark schemes and student responses are in your pack. Mark each response.

Paper 1F June 2019

- 5** There are 12 481 people at a concert.  
8906 of these people are adults.  
The rest of the people are children.  
 $\frac{3}{5}$  of the children are boys.  
Work out the number of girls at the concert.

Paper 2H June 2019

- 20** The equation of the line **L** is  $y = 9 - x$   
The equation of the curve **C** is  $x^2 - 3xy + 2y^2 = 0$   
**L** and **C** intersect at two points.  
Find the coordinates of these two points.  
Show clear algebraic working.

# The marks were awarded as follows: Question 5 Paper 1F

- 5) There are 12 481 people at a concert.  
8906 of these people are adults.  
The rest of the people are children.  
 $\frac{3}{5}$  of the children are boys.

Work out the number of girls at the concert.

12 481  
12 481 people - 8906 = 3575 = children  
 $\frac{3}{5}$  of 3575 = 2145  
12 481 - 2145 = 10336 girls  
10336  
~~2145~~

(Total for Question 5 is 4 marks)

M1 – for finding 3575  
M1 – for finding 2145  
M0 – the candidate subtracts the number of boys from the total instead of the number of children  
A0 – follows M0

- 5 There are 12 481 people at a concert.  
8906 of these people are adults.  
The rest of the people are children.  
 $\frac{3}{5}$  of the children are boys.

Work out the number of girls at the concert.

3575

2145

(Total for Question 5 is 4 marks)

Although there is no working at all we can award:  
M1 – for finding 3575  
M1 – for finding 2145  
No further marks.



# The marks were awarded as follows: Question 20 Paper 2H

20 The equation of the line **L** is  $y = 9 - x$   
The equation of the curve **C** is  $x^2 - 3xy + 2y^2 = 0$

**L** and **C** intersect at two points.

Find the coordinates of these two points.  
Show clear algebraic working.

$$y = 9 - x$$

$$x^2 - 3xy + 2y^2 = 0$$

$$x^2 - 3x(9 - x) + 2(9 - x)(9 - x) = 0$$

$$x^2 - 27x + 3x^2 + 2(81 - 17x) = 0$$

$$x^2 - 27x + 3x^2 + 162 - 34x = 0$$

$$4x^2 - 61x + 162 = 0$$

$$\begin{array}{cc} 2x & 9 \\ 2x & 18 \end{array}$$

$$36$$

$$54$$

$$\begin{array}{l} 9 - 11.8 \\ = -2.8 \end{array}$$

$$x_1 = 11.8$$

$$y_1 = -2.8$$

$$x_2 = 3.4$$

$$y_2 = 5.6$$

M1 – for correct substitution

A0 – incorrect 3TQ

dM1 – for a complete method to solve their 3TQ

A0,A0 Incorrect values.

20 The equation of the line **L** is  $y = 9 - x$   
The equation of the curve **C** is  $x^2 - 3xy + 2y^2 = 0$

**L** and **C** intersect at two points.

Find the coordinates of these two points.  
Show clear algebraic working.

$$x^2 - 3x(9 - x) + 2(9 - x)(9 - x) = 0$$

$$x^2 - 27x + 3x^2 + 2(81 - 17x + x^2) = 0$$

$$x^2 - 27x + 3x^2 + 162 - 34x + 2x^2 = 0$$

$$6x^2 - 61x + 162 = 0$$

$$6x^2 - 36x - 27x + 162 = 0$$

$$6x(x - 6) - 27(x - 6) = 0$$

$$(6x - 27)(x - 6) = 0$$

$$x = -4.5 \text{ or } 6$$

$$9 - 4.5 = 4.5$$

$$(-4.5, 4.5)$$

$$9 - 6 = 3$$

$$(6, 3)$$

M1 – for correct substitution

A1 – correct 3TQ

M1 – for a complete method to solve their 3TQ (this mark is dependent on the first M mark)

A0 – Only one correct x value

A0 – only one pair of correct coordinates.

# Activity 7

## Marking Activity (2)

Question 9 June 2019 4MB1 Paper 2

9

$$\mathbf{p} = \begin{pmatrix} 2x - 1 \\ y \end{pmatrix} \quad \mathbf{q} = \begin{pmatrix} y + 3 \\ -y \end{pmatrix}$$

The vectors  $\mathbf{p}$  and  $\mathbf{q}$  are such that  $|\mathbf{p}| = \sqrt{98}$  and  $\mathbf{p} + \mathbf{q} = \begin{pmatrix} 7 \\ 0 \end{pmatrix}$

(a) Show that  $x^2 - 3x - 9 = 0$

(5)

Given that  $x > 0$

(b) (i) find the exact value of  $x$ ,

(2)

(ii) show that  $y = 2 - 3\sqrt{5}$

(2)

(c) Find the exact value of  $|\mathbf{q}|^2$   
Show your working clearly.

(3)

## Marking Activity (2) Task

In your delegate books you have the question, the mark scheme and three student responses.

1. Please mark all of the student responses in pairs or small groups.
2. Rank them in order of ease of marking.
3. What do you notice about the difference in quality of work/clarity/orderly approach in these responses?

# Response 1

(c) Find the exact value of  $|q|^2$   
Show your working clearly.

$$x^2 - 3x - 9 = 0$$

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

$$x = \frac{3 \pm \sqrt{(-3)^2 - 4 \times 1 \times -9}}{2 \times 1}$$

$$x = \frac{3 \pm \sqrt{9 + 36}}{2}$$

$$x = \frac{4.85}{2} = 2.425$$

$$\begin{pmatrix} 2x-1 \\ y \end{pmatrix} + \begin{pmatrix} y+3 \\ -y \end{pmatrix} = \begin{pmatrix} 7 \\ 0 \end{pmatrix}$$

$$2x - 1 + y + 3 = 7$$

$$2x + y = 5$$

$$y = 5 - 2x$$

$$r = y =$$

$$y + -y = 0$$

$$y - y = 0$$

$$0 = 0$$

$$-b \pm \sqrt{b^2 - 4ac}$$

Part (a) no attempt

M1

(3)

$$(q)^2 = (2 - 3\sqrt{5})^2$$

$$q^2 = (2 - 3\sqrt{5})^2$$

$$q^2 = (2 - 3\sqrt{5})(2 - 3\sqrt{5})$$

$$2(2 - 3\sqrt{5}) - 3\sqrt{5}(2 - 3\sqrt{5})$$

$$4 - 6\sqrt{5} - 6\sqrt{5} + 45$$

$$= 49 - 12\sqrt{5}$$

$$q^2 = 49 - 12\sqrt{5}$$

No further marks available

# Response 2

$$a. \begin{pmatrix} 2x-1 \\ y \end{pmatrix} + \begin{pmatrix} y+3 \\ -y \end{pmatrix} = \begin{pmatrix} 7 \\ 0 \end{pmatrix}$$

$$2x-1+y+3=7$$

$$2x+y+2=7$$

$$2x+y+2-1=0$$

$$2x+y-5=0$$

$$y=5-2x$$

$$|p| = \sqrt{(2x-1)^2 + (y)^2}$$

$$\sqrt{98} = \sqrt{(2x-1)^2 + y^2}$$

$$\sqrt{98} = \sqrt{(2x-1)^2 + (5-2x)^2}$$

$$\sqrt{98} = \sqrt{4x^2 - 4x + 1 + x^2 - 4x + 25}$$

$$\sqrt{98} = \sqrt{5x^2 - 8x + 26}$$

$$8x^2 - 24x + 26 = (\sqrt{98})^2$$

$$8x^2 - 24x + 26 = 98$$

2<sup>nd</sup>  
M1

1<sup>st</sup>  
M1

3<sup>rd</sup>  
M1

M1A  
1

$$8x^2 - 24x + 26 - 98 = 0$$

$$8x^2 - 24x - 72 = 0$$

$$8(x^2 - 3x - 9) = 0$$

$$x^2 - 3x - 9 = 0$$

$$b. (i) x^2 - 3x - 9 = 0$$

$$(x-3)(x+3)$$

$$p = q \quad q = 3$$

$$-3+3 \quad -3+3$$

$$a = 1 \quad b = -3 \quad c = -9$$

$$x = \frac{3 \pm \sqrt{(-3)^2 - (4 \times 1 \times -9)}}{2 \times 1}$$

M1

$$x = \frac{3 + \sqrt{45}}{2}$$

$$\text{or } x = \frac{3 - \sqrt{45}}{2}$$

A1

$$\text{Ans: } x = \frac{3 + \sqrt{45}}{2}$$

$$(ii) y = 5 - 2x$$

$$y = 5 - 2\left(\frac{3 + \sqrt{45}}{2}\right)$$

M1

$$y = 5 - 3 \mp \sqrt{45}$$

$$y = 2 \mp \sqrt{5 \times 3 \times 3}$$

$$y = 2 \mp 3\sqrt{5}$$

A1

## Response 2 (cont'd)

M1

$$c. |q|^2 = (y+3)^2 + (y)^2$$

$$|q|^2 = y^2 + 6y + 9 + y^2$$

$$|q|^2 = 2y^2 + 6y + 9$$

$$|q|^2 = 2((2-3\sqrt{5})(2+3\sqrt{5})) + 6(2-3\sqrt{5}) + 9$$

$$|q|^2 = 2(4 - 6\sqrt{5} - 6\sqrt{5} + 45) + 12 - 18\sqrt{5} + 9$$

M1

$$|q|^2 = 8 - 24\sqrt{5} + 90 + 12 - 18\sqrt{5} + 9$$

$$|q|^2 = 119 - 24\sqrt{5} - 18\sqrt{5}$$

A1

$$|q|^2 = 119 - 42\sqrt{5}$$

# Response 3

9. a)  $\sqrt{(2x-1)^2 + y^2}$

$\sqrt{4x^2 - 4x + 1 + y^2}$

$= \sqrt{4x^2 - 4x + 1 + y^2} = \sqrt{98}$

$4x^2 - 4x + 1 + y^2 = 98$

$4x^2 - 4x + y^2 = 97$

$4x^2 - 4x - 97 = -y^2$

$-4x^2 + 4x + 97 = y^2$

$4x^2 - 4x - 97 = -y^2$

$(2x-1) + (y+3) = (7)$

$(y) + (-y) = (6)$

1st M1

A0

$2x-1+y+3=7$

$2x+y=5$

$y=5-2x$

$y^2+4x^2-4x-97$

$(5-2x)^2(5-2x)$

$25-10x-10x+4x^2$

$25-20x+4x^2$

$4x^2-20x+25+4x^2-4x-97$

$8x^2-20x+25-4x-97$

$8x^2-24x-72=0$

$8x^2-24x=72$

$8x^2-24x-72=0$

$x^2-3x-9=0$

$x = \frac{3 \pm \sqrt{(-3)^2 - 4 \times 1 \times (-9)}}{2 \times 1}$

$= 4.854101966$

$x = 5 - 2x - 1 + y + 3 = 7$

$2x + y = 5$

$y = 5 - 2x$

$y = 5 - 2(4.854101966)$

$y = 2 - 3\sqrt{5}$

2nd M1

3rd M1

M1A1

M1

$d) a = (y+3)$

$= (2-3\sqrt{5})+3$

$= (5-3\sqrt{5})$

$= (5-3\sqrt{5})$

$= \sqrt{(5-3\sqrt{5})^2 + (-2+3\sqrt{5})^2}$

$= (5-3\sqrt{5})$

$= 25.0851$


M0

dM10A0

M0A0

## Activity 8 - How can I teach good exam technique?

- Ensuring that students practise using a whole paper and understand how it is laid out.
- Understand the importance of looking at the mark allocation.
- Read the whole question first, before any attempt is made to answer it.
- Always showing complete methods – an examiner can only assess what a student is thinking by their written work in the examination paper.
- Encouraging students to write neatly and work in an orderly manner.
- Understanding that we always provide more than enough paper – you don't need to fill the whole booklet!
- Walking-talking mocks

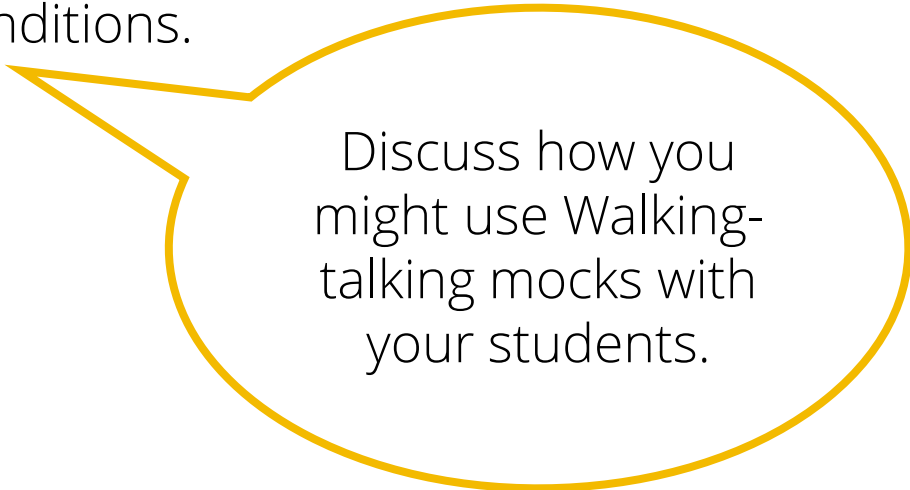


Discuss. Does anyone have any other tips?



## Activity 9 - Walking-talking mocks

- Students sit in the same exam room where they will do their exam, preferably in the same seats
- Students are given an exam paper which is as close to being like the real thing as possible (i.e. exam writing booklet if relevant)
- Students are literally walked through every question on the paper – the person leading the session talks them through the smallest steps, such as underlining key words, how to plan, things to remember etc.
- Students then write their responses in timed conditions.



Discuss how you might use Walking-talking mocks with your students.

## Session 3

The support on offer from  
Pearson



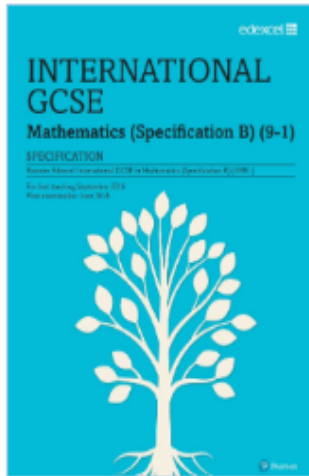
# Guidance and support

- A wide range of support resources and materials are available on the Pearson website (screenshots of some of these are on the following slides).
- The support includes exam materials and teaching and learning support as well as a range of analysis and planning tools.
- The next slides show the materials available for 4MB1. The pages for 4MA1 have similar specification specific content.

# Guidance and support on key content 4MB1

<https://qualifications.pearson.com/en/qualifications/edexcel-international-gcse-and-edexcel-certificates/international-gcse-mathematics-b-2016.html#tab-Teaching>

## Specification



**DOWNLOAD**

PDF | 1.3 MB

**Qualification type:** International GCSE

**Level:** Level 2

**Subject:** Mathematics B

**Specification codes:** 4MB1

**Availability:** International and UK Independent Schools ?

**First teaching:** 2016

**First assessment:** 2018

## Course materials

Specification and sample assessments (2)

Exam materials (37)

Teaching and learning materials (13)

# Guidance and support

Exemplars

## Exemplar material



[Exemplar - student answers with examiner comments](#)  
| PDF 5.0 MB | 20 Dec 2016



[International GCSE in Mathematics B Paper 1 exemplars](#)  
Post June 2019 series  
| PDF 1.3 MB | 18 Nov 2019



[International GCSE in Mathematics B Paper 2 exemplars](#)  
Post June 2019 series  
| PDF 2.5 MB | 18 Nov 2019

## Guide



[Getting started guide](#)  
| PDF 1.6 MB | 28 Nov 2016

## Lesson plan



[Teaching transferable skills guide](#)  
| PDF 1.4 MB | 22 Feb 2017

## Mapping document



[Textbook mapping document](#)  
| XLSX 25.6 KB | 11 Aug 2017

Getting started guide

Scheme of Work and lesson plans published in Word

## Scheme of work



[International GCSE Mathematics B - Scheme of work](#)  
| DOCX 298.8 KB | 01 Nov 2016

## Skills for learning and work



[Skills Mapping for Mathematics B](#)  
| PDF 418.2 KB | 16 Jan 2018



[Transferable skills subject definitions for Mathematics A and B](#)  
| PDF 163.7 KB | 07 Dec 2016

## Teacher guide



[Teacher guide](#)  
| PDF 454.4 KB | 04 Jun 2016

Exemplars – these are found on the home page for the specification on the website

ils (37)

Teaching and learning  
materials (13)

1 - 13 of 13

### Exemplar material



Exemplar - student answers with examiner comments

| PDF 5.0 MB | 20 Dec 2016



International GCSE in Mathematics B Paper 1 exemplars

Post June 2019 series

| PDF 1.3 MB | 18 Nov 2019



International GCSE in Mathematics B Paper 2 exemplars

Post June 2019 series

| PDF 2.5 MB | 18 Nov 2019



## How to use the exemplar materials

- The examining team have selected responses to a number of questions.
- The questions and mark schemes are printed out.
- Following each question is a range of student responses with accompanying examiner comments on how the mark scheme has been applied and the marks awarded.
- Common errors for questions are highlighted.

# An example of the content

## The question and mark scheme

### Paper 1

---

#### Exemplar Question 1

7. The point  $A$  has co-ordinates  $(3, -4)$ , with respect to the origin  $O$ .

The point  $C$  is such that  $\overrightarrow{AC} = \begin{pmatrix} -5 \\ 7 \end{pmatrix}$

Express, as a column vector, the position vector of  $C$ .

(Total for Question 7 is 2 marks)

---

#### Mark Scheme

Question	Working	Answer	Mark	AO	Total
7.	$\overrightarrow{OC} = \begin{pmatrix} 3 \\ -4 \end{pmatrix} + \begin{pmatrix} -5 \\ 7 \end{pmatrix}$		M1	2.8	
		$\begin{pmatrix} -2 \\ 3 \end{pmatrix}$	A1		2



## Student responses (1)

### Student Response B

The point  $C$  is such that  $\vec{AC} = \begin{pmatrix} -2 \\ 3 \end{pmatrix}$   $(-2, 3)$

$$\begin{pmatrix} -5 \\ 7 \end{pmatrix}$$

Express, as a column vector, the position vector of  $C$ .

$$C = \begin{pmatrix} -2 \\ 3 \end{pmatrix}$$

2/2

#### Examiner Comments

Correct answer for  $\vec{OC}$  given with no working seen therefore M1 A1.

NB: However, as a rule, *incorrect* working followed by a *correct* answer will score zero marks.

Commentary  
with advice.

## Student responses (2)

### Student Response C

7 The point  $A$  has co-ordinates  $(3, -4)$ , with respect to the origin  $O$ .

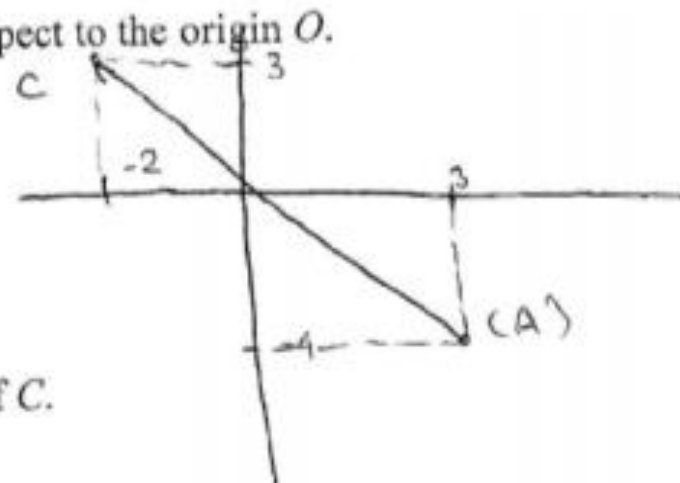
The point  $C$  is such that  $\vec{AC} =$

$$\begin{pmatrix} -5 \\ 7 \end{pmatrix}$$

Express, as a column vector, the position vector of  $C$ .

$$C = (-2, 3)$$

$$C = -2i + 3j$$



1/2

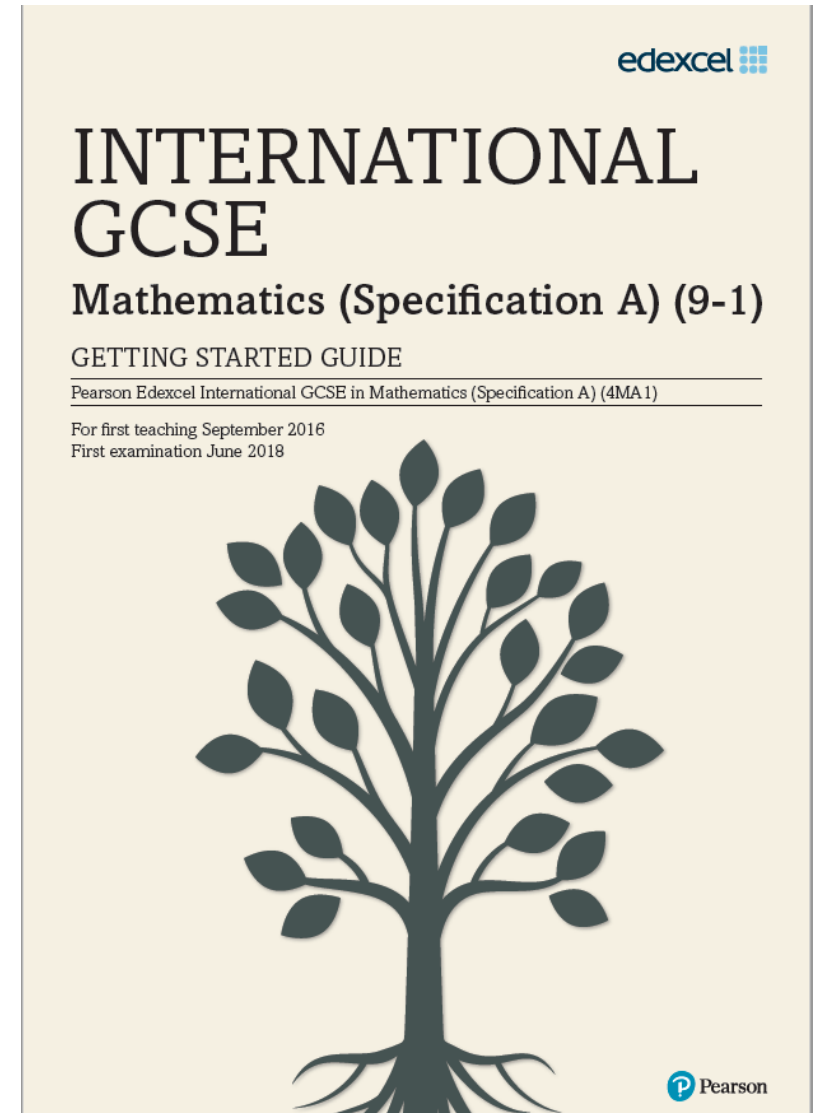
#### Examiner Comments

Correct diagram (M1) but the answer is not given as a column vector (A0).

# Getting started guide

The Getting started guide provides an overview of the International GCSE specifications to help centres get to grips with the content and assessment and to help understand what these mean to centres and their students.

This guide includes suggested activities and resource lists.



# Transferable skills

Transferable skills help students cope with the different demands of further study and provide a solid skills base that enables them to thrive in different environments across educational stages and ultimately into employment.

Transferrable skills have been embedded into International GCSE examinations and resources.

edexcel

 Pearson

## **International GCSE Mathematics**

### **A guide to teaching transferable skills**

# Training materials

The packs that have been used in previous training sessions are listed on the website.

## Past training content



Getting Ready to Teach Pearson Edexcel International GCSE (9-1)  
Mathematics A & B specifications from September 2016 (Live  
Online Event for International Centres)

| ZIP 20.6 MB | 29 Dec 2017



Getting Ready to Teach the Pearson Edexcel International GCSE  
Mathematics A & B (9-1) (4MB1)

| ZIP 19.7 MB | 13 Feb 2018



Getting Ready to Teach the Pearson Edexcel's International GCSE  
Mathematics A & B (9-1) (4MB1) (4MA1) for first assessment in  
June 2018 - Face to Face Event

| ZIP 20.5 MB | 22 Mar 2019

# Subject home page

## International GCSEs and Edexcel Certificates Mathematics A (2016)



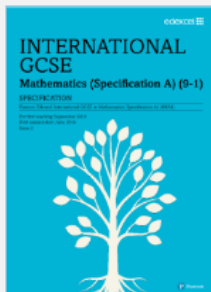
**Specification**

[Course materials](#)

[Published resources](#)

[News](#)

### 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.

### Register your interest

Find out more about Pearson Edexcel International qualifications and sign up to receive the latest news.

[Let us know](#) 

### Course materials

- [Specification and sample assessments](#) (2)
- [Exam materials](#) (76)
- [Teaching and learning materials](#) (29)



### Teaching support and training

- [Training sessions](#)
- [Results support](#)
- [New 9-1 grading scale explained](#)



FEEDBACK

# Contact your dedicated Subject Advisor

Subject Advisor details

Your subject advisor is **Nicola and Mark**

Twitter: **@EmporiumMaths**

Email: [TeachingMaths@pearson.com](mailto:TeachingMaths@pearson.com)

Phone : + 44 (0)20 7010 2174



Sign up for monthly newsletters from <https://qualifications.pearson.com/en/forms/keep-updated-on-pearson-edexcel-qualifications.html> to stay on top of qualification updates, training, course materials and industry news and <https://qualifications.pearson.com/en/forms/sign-up-international-online-subject-expert-panels.html> to see what other teachers are thinking and doing.

# Support overview - Mathematics

Getting Started  
Guide & Scheme of  
Work

Welcome to Pearson  
Events

Subject  
interpretation of  
transferable skills

Subject Advisor

Results Plus

Regional Support  
Manager

Curriculum Matched  
Publishing

Qualification Guides

Additional SAMs

Exemplar marked  
responses with  
commentaries

Examwizard

Access to Scripts





- 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


# ResultsPlus Home page


**Select an option**


**Results Plus Analysis**  
Analysis and reports on your Edexcel examinations


**Mock Analysis Service**  
Print off past papers, assign papers to students for mock mark entry, enter student marks, analyse performance

**Create or edit a group**  
Set up classes and other groups to help analyse performance

**Functional Skills on Demand Analysis**  
Analysis and reports of your student's test performance

**BTEC Analysis**  
Analysis of your student's BTEC National External Test performance

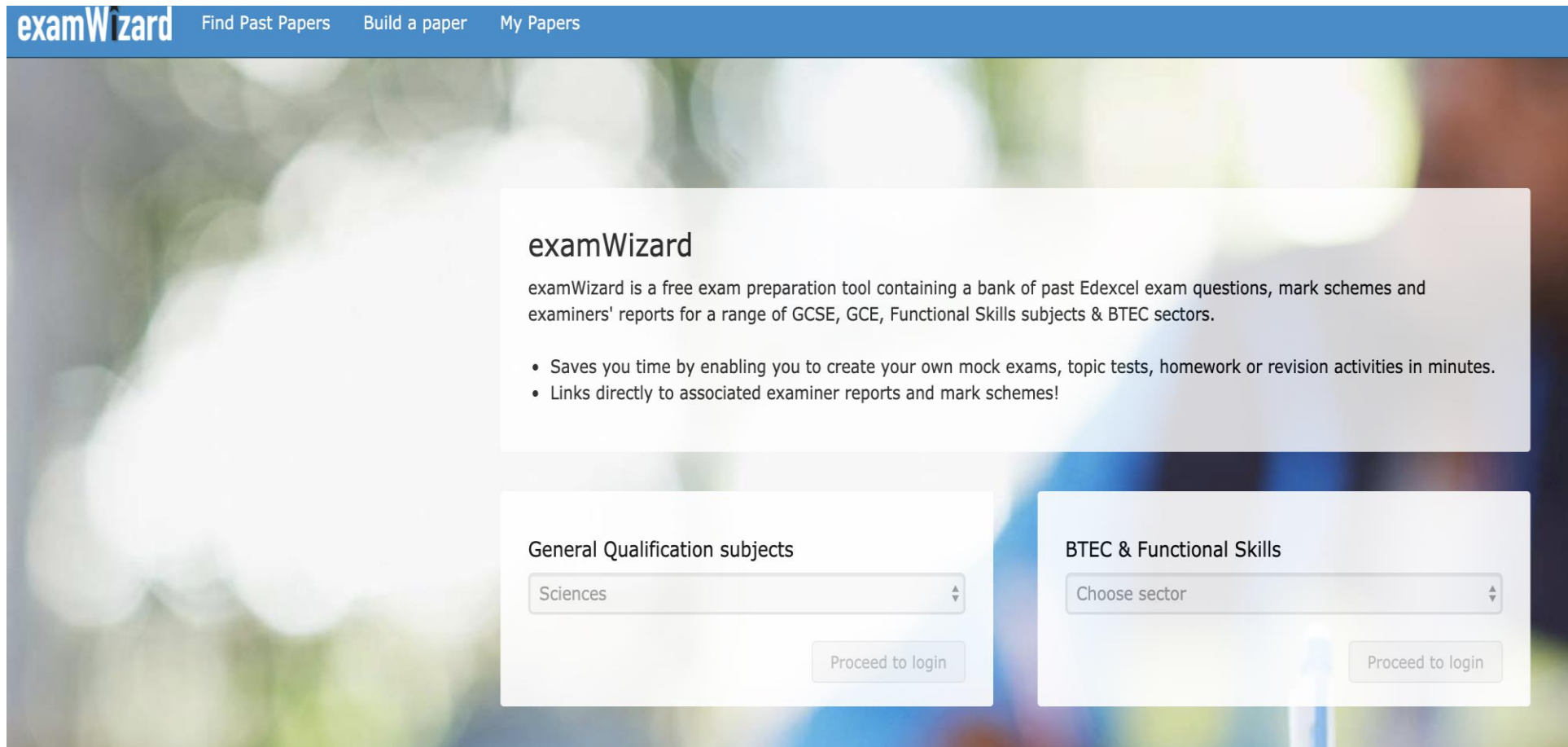
**Global Results Analysis**  
View overall performance for the whole Edexcel cohort

**Retrieve Incoming Learner Results**  
Retrieve Pearson results from a learner's previous centre



- 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.

# ExamWizard Home page

The screenshot shows the ExamWizard website's home page. At the top is a blue navigation bar with the 'examWizard' logo and three links: 'Find Past Papers', 'Build a paper', and 'My Papers'. The main content area has a blurred background image of a person. A central white box contains the 'examWizard' logo, a description of the site as a free exam preparation tool, and two bullet points highlighting its features. Below this are two white boxes for subject selection. The left box, titled 'General Qualification subjects', has a dropdown menu showing 'Sciences' and a 'Proceed to login' button. The right box, titled 'BTEC & Functional Skills', has a dropdown menu showing 'Choose sector' and a 'Proceed to login' button.

examWizard

Find Past Papers Build a paper My Papers

**examWizard**

examWizard is a free exam preparation tool containing a bank of past Edexcel exam questions, mark schemes and examiners' reports for a range of GCSE, GCE, Functional Skills subjects & BTEC sectors.

- Saves you time by enabling you to create your own mock exams, topic tests, homework or revision activities in minutes.
- Links directly to associated examiner reports and mark schemes!

**General Qualification subjects**

Sciences

Proceed to login

**BTEC & Functional Skills**

Choose sector

Proceed to login

# New 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.

# Post results services

Reviews of marking and moderation (RoMM)

Access to scripts (ATS)

Appeals

Our Reviews of marking and moderation (RoMM) services allow you to request us to run additional checks that the grades we've issued your candidates are correct.

Clerical check (Service 1)



Review of marking of externally assessed components (Service 2)



Priority review of marking of externally assessed components (Service P2)



Review of moderation for internally assessed/externally moderated controlled assessment and coursework components (Service 3)



If a centre is concerned about the marking of a centre cohort







# Other useful links

## [1. Grade Boundaries](#)

This page shows the minimum marks needed to achieve a certain grade for all UK and international examinations. Also refer to the examiners report which is available for download with other documents.

## [2. Examination Results Statistics](#)

Results statistics summarise the overall grade outcomes of candidates sitting Pearson Edexcel examinations.

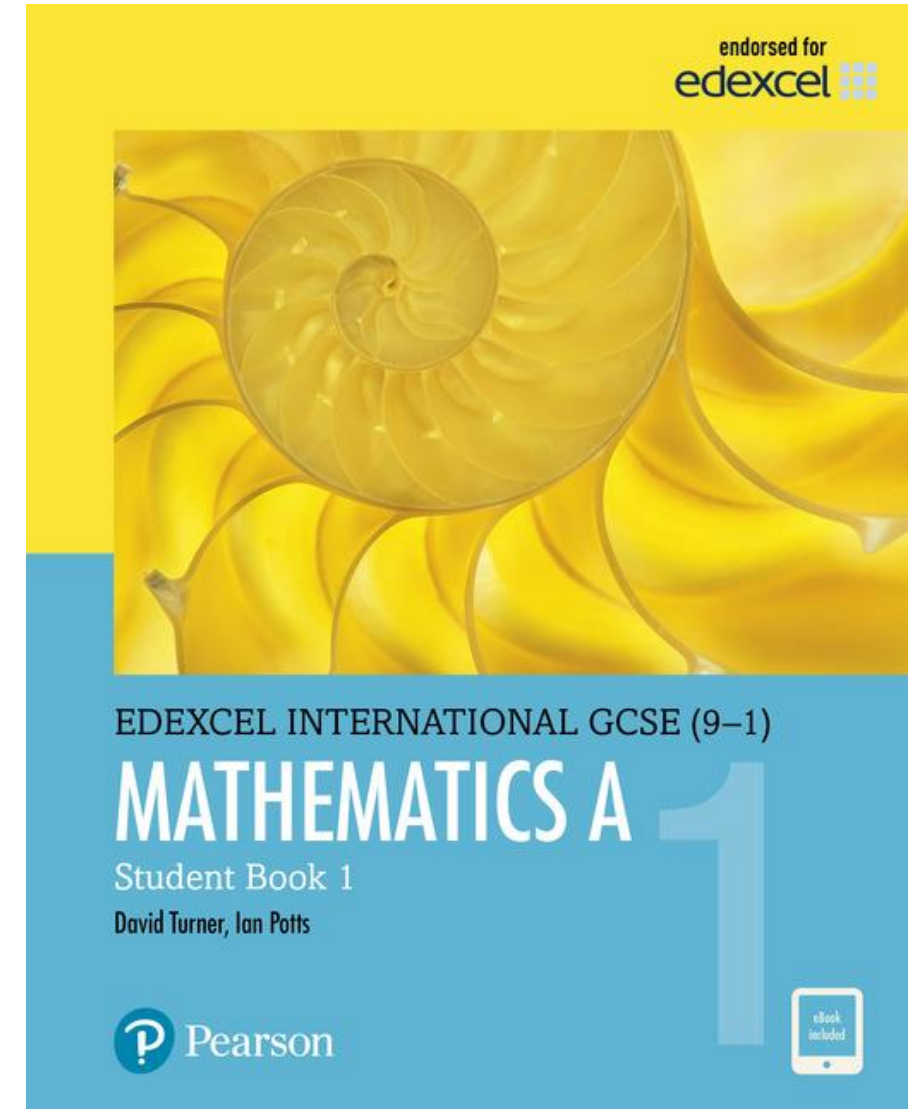
## [3. Progress to University](#)

Here you can find information and guidance about how to progress to universities worldwide with Pearson Edexcel qualifications.



# Pearson Publishing

- Written by highly experienced teachers and authors David Turner and Ian Potts, Edexcel International GCSE (9–1) Mathematics provides students with the best preparation possible for the examination. Together, Student Books 1 and 2 provide comprehensive coverage of the Higher Tier specification.
- The new 9-1 grading scale ensures a consistent international standard of qualification. The increase in levels of grading allows learners to achieve their full potential and make more informed decisions about their options for progression.
- Pearson Progression tools allows quick and easy formative assessment of student progress, linked to guidance on how to personalise learning solutions.
- Specifically developed for international learners, with appropriate international content, making it engaging and relevant for all learners and allowing for learning in a local context, to a global standard.
- EAL-focused content, checked by an EAL specialist, addresses the needs of EAL students with carefully graded writing to B2/C1 level -(CEFR) and a glossary provided of specialist Maths vocabulary.

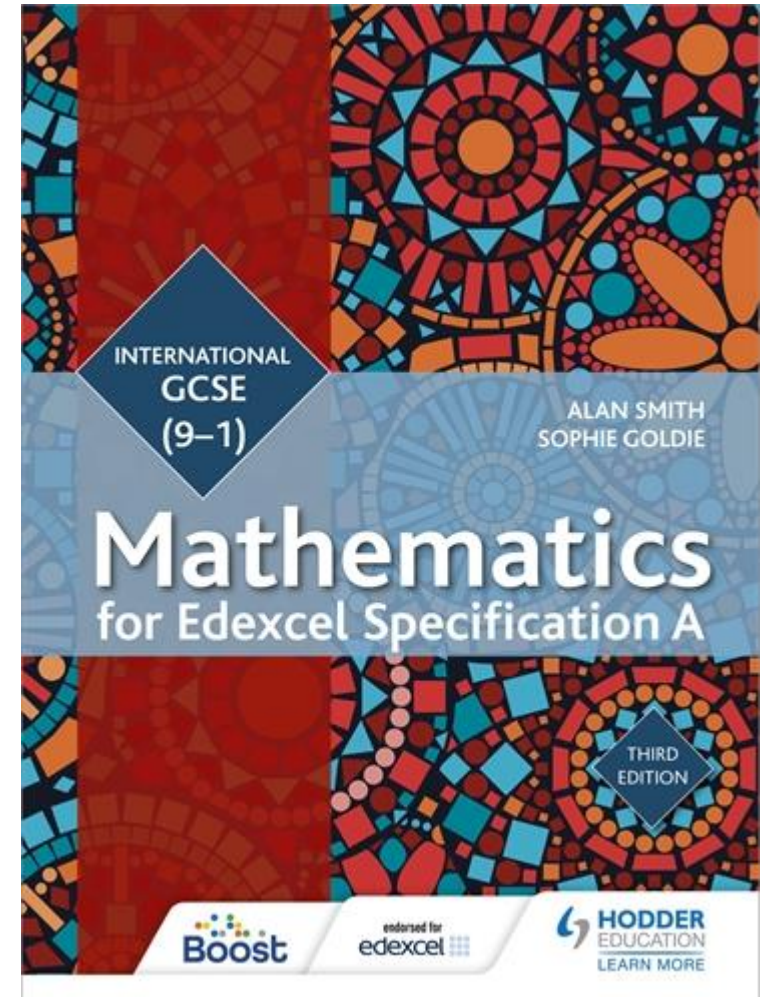


# Endorsed Publishing

**Nurture and strengthen your students' mathematical skills; these expert-written textbooks consolidate knowledge with worked examples, test key skills through practice and extend learning using enrichment activities designed to excite and challenge students.**

- Support and develop a deeper understanding of topics with plenty of worked examples and practice questions that follow the types of problems students are likely to face
- Introduce students to content with fun activities and clear learning objectives at the start of each chapter
- Build problem-solving skills with questions that test students' knowledge and comprehension
- Further understanding and ignite an enthusiasm for maths with 'internet challenges' that extend learning beyond the curriculum and help to engage students
- Offer a complete package of support with free downloadable resources that include detailed worked examples and answers, plus informative 'Personal Tutor' videos for each chapter

\* Please note Hodder publishing is for Mathematics A **only**

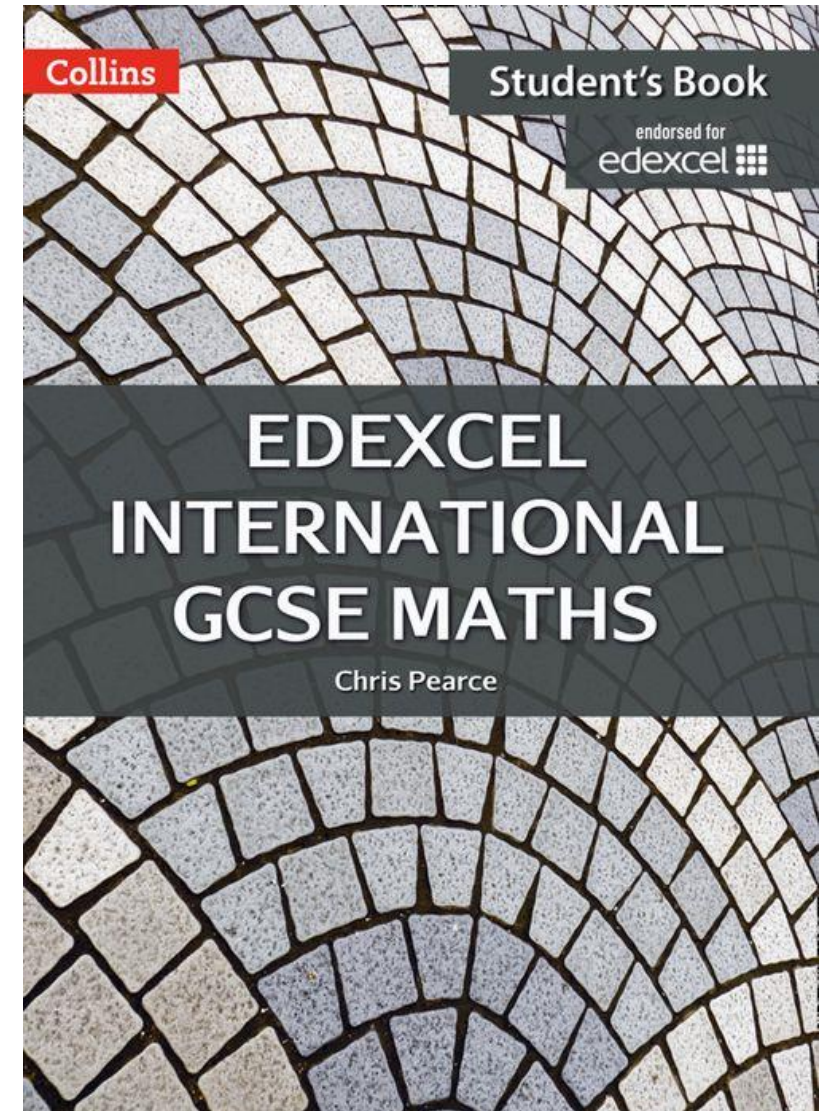


# Endorsed Publishing

Ensure top marks and complete coverage for the new Edexcel International Level 1/Level 2 GCSE in Mathematics (Specification A) (9-1) with Collins' fully revised and updated resources. Provide rigour with thousands of tried and tested questions using international content and levels clearly labelled to aid transition from Foundation to Higher.

- Endorsed by Edexcel
- Ensure students are fully prepared for their exams with extensive differentiated practice exercises, detailed worked examples and International GCSE past paper questions.
- Stretch and challenge students with supplementary content for Higher level examinations and extension level questions highlighted on the page.
- Emphasise the relevance of maths with features such as 'Why this chapter matters' which show its role in everyday life or historical development.
- Develop problem solving with questions that require students to apply their skills, often in real life, international contexts.
- Enable students to see what level they are working at and what they need to do to progress with Foundation and Higher levels signalled clearly throughout.
- Encourage students to check their work with answers to all exercise questions at the back (answers to examination sections are available in the accompanying Teacher Guide).

\* Please note Collins publishing is for Mathematics A **only**





# Questions





Pearson