

# Pearson Edexcel International GCSE Mathematics

## Understanding Assessment and Improving Outcomes

4MA1-251F1

First teaching in 2017, first assessment in 2019



# Agenda

Time	Session
10:00	Welcome & Introductions
10:10	What assessment objectives are. Activity 1
10:15	How assessment objectives work. Activity 2
11:15	Break
11:30	Mathematical reasoning and problem solving. Activities 3 and 4
12:45	Lunch
13:30	Reasoning and associated types of questions. Activity 5
14:45	How to use Assessment Objectives to construct papers. Activities 6 and 7
15:30	Improving students' ability to answer reasoning and problem-solving questions
16:00	Finish



# Aims & Objectives

- be introduced to the idea of assessment objectives: what are they and why they are used when writing examination papers,
- analyse recent question papers and learn which types of question match the different assessment objectives,
- investigate different assessment objectives, considering how questions in these areas have been answered by looking at feedback from previous exam series,
- discuss strategies for teaching to try and make sure students can access questions targeting different assessment objectives,
- review the support Pearson offers for the qualification,
- network, discuss best practice and share ideas with other teachers.

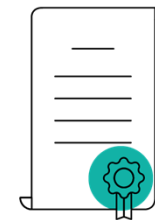
# Welcome to Pearson

# 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

# Introduction to Assessment



# Structure of an Assessment

The **key task** of an assessment in mathematics is to measure a student's ability in mathematics.

This means producing a mechanism which enables the student to **demonstrate** their ability to express these mathematical constructs.

Possible mechanisms by which this can be done include:

- Discussion with the student / guided problem solving
- Coursework or extended problem solving
- Written examinations/ tests.

# Structure of an Assessment

A written test seeks to measure student's ability (in mathematics) by requiring them to **demonstrate** their knowledge of mathematical facts and their ability to work with mathematical concepts.

In Edexcel examinations this means that the specification includes details of:

the mathematical facts and skills that have to be learned



Content

the way(s) in which the student will have to demonstrate what they have learned.



Assessment  
Objectives



# Structure of an Assessment

## Content

Facts

Techniques

Relationships

## Assessment Objectives

Demonstrate knowledge of facts, techniques and relationships  
(DO IT)

Demonstrate application of facts, techniques and relationships to solve problems  
(SOLVE IT)

Demonstrate mathematical reasoning by using application of facts, techniques and relationships to solve problems  
(SHOW IT)

In outline this is the Edexcel Int GCSE scheme.



# Structure of an Assessment

## Content coverage

- sufficient for each separate assessment
- (samples from (nearly) all sections of the content list)
- complete coverage over a cycle of assessments

## Assessment Objectives

- fixed from assessment to assessment
- same weightings from assessment to assessment (some leeway allowed)

# Structure of an Assessment

An example page from the GCSE 4MA1 spec – Content pages 11 - 39

## 1 Numbers and the number system

	Students should be taught to:	Notes
<b>1.1 Integers</b>	<b>A</b> understand and use integers (positive, negative and zero)	
	<b>B</b> understand place value	
	<b>C</b> use directed numbers in practical situations	e.g. temperatures
	<b>D</b> order integers	
	<b>E</b> use the four rules of addition, subtraction, multiplication and division	
	<b>F</b> use brackets and the hierarchy of operations	
	<b>G</b> use the terms 'odd', 'even', 'prime numbers', 'factors' and 'multiples'	
	<b>H</b> identify prime factors, common factors and common multiples	
<b>1.2 Fractions</b>	<b>A</b> understand and use equivalent fractions, simplifying a fraction by cancelling common factors	$\frac{8}{60} = \frac{2}{15}$ in its simplest form (lowest terms)

# Structure of the Edexcel Assessment

Assessment Objective	Demonstrate knowledge, understanding and skills in	Percentage
AO1	number and algebra: <ul style="list-style-type: none"><li>• numbers and the numbering system</li><li>• calculations</li><li>• solving numerical problems</li><li>• equations, formulae and identities</li><li>• sequences, functions and graphs.</li></ul>	$60 \pm 3$
AO2	shape, space and measures: <ul style="list-style-type: none"><li>• geometry and trigonometry</li><li>• vectors and transformation geometry.</li></ul>	$25 \pm 3$
AO3	handling data: <ul style="list-style-type: none"><li>• statistics</li><li>• probability.</li></ul>	$15 \pm 3$

In outline this is the Edexcel Int GCSE scheme.



# Structure of the Edexcel Assessment

Sitting with these weightings are the higher order skills of:

- Mathematical problem solving
- Mathematical reasoning and argument

These are not 'add-ons' but are embedded in the 3AOs.

# Structure of the Edexcel Int GCSE assessment – all papers

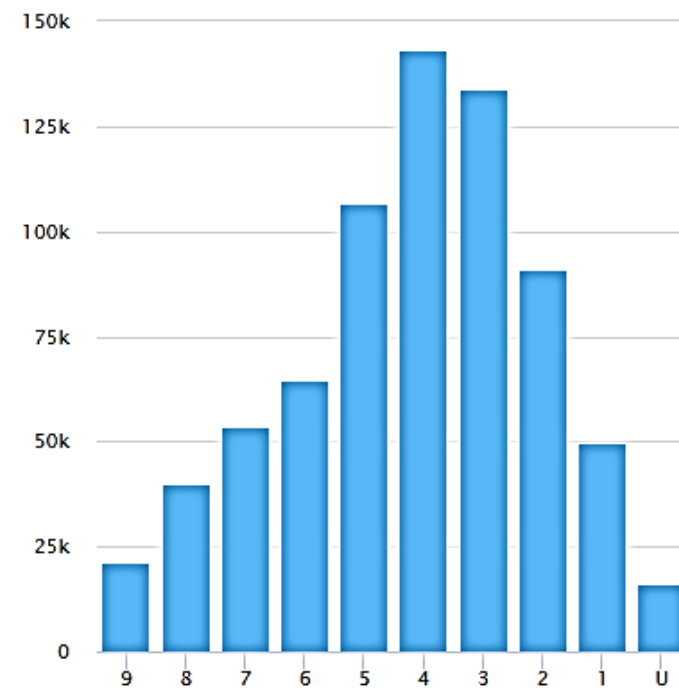
All figures in the following table are expressed as marks out of 100.

	AO1	AO2	AO3	Problem Solving	Mathematical Reasoning
1F	60	25	15	25	15
2F	60	25	15	25	15
1H	60	25	15	30	20
2H	60	25	15	30	20

# Structure of the Edexcel Int GCSE assessment – all papers

Combinations of suitable content, assessment objectives and demand can lead to outcomes like this:

There were...  
719,840 students certificated in mathematics



<https://analytics.ofqual.gov.uk/apps/GCSE/9to1/>

# 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
<b>Foundation Tier</b> <ul style="list-style-type: none"><li>• Duration: 2 hours</li><li>• Total number of marks: 100</li><li>• Weighting: 50%</li><li>• Grad range: 5-1</li></ul>	<b>Foundation Tier</b> <ul style="list-style-type: none"><li>• Duration: 2 hours</li><li>• Total number of marks: 100</li><li>• Weighting: 50%</li><li>• Grad range: 5-1</li></ul>
<b>Higher Tier</b> <ul style="list-style-type: none"><li>• Duration: 2 hours</li><li>• Total number of marks: 100</li><li>• Weighting: 50%</li><li>• Grad range: 9-4 with an allowable grade 3</li></ul>	<b>Higher Tier</b> <ul style="list-style-type: none"><li>• Duration: 2 hours</li><li>• Total number of marks: 100</li><li>• Weighting: 50%</li><li>• Grad range: 9-4 with an allowable grade 3</li></ul>
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 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>Number (AO1)</p> <ul style="list-style-type: none"><li>• Basic number skills</li><li>• Standard form</li><li>• Limits of accuracy</li><li>• <b>Surds and indices</b></li></ul>	<p>Number (AO1)</p> <ul style="list-style-type: none"><li>• Ratio and proportion</li><li>• Percentage skills</li><li>• Standard form</li><li>• <b>Repeated percentage change</b></li></ul>
<p>Algebra (AO1)</p> <ul style="list-style-type: none"><li>• Basic algebra skills</li><li>• Set notation</li><li>• Plotting graphs</li><li>• Solving basic quadratics <math>x^2 + bx + c = 0</math></li><li>• <b>Solving quadratics <math>ax^2 + bx + c = 0</math></b></li><li>• <b>Completing the square</b></li><li>• <b>The quadratic formula</b></li></ul>	<p>Algebra (AO1)</p> <ul style="list-style-type: none"><li>• Inequalities</li><li>• Simultaneous equations</li><li>• Sequences</li><li>• Change of subject</li><li>• <b>Algebraic proof</b></li><li>• <b>Direct and inverse proportion</b></li><li>• <b>Summation of arithmetic series</b></li><li>• <b>Function notation and transformations</b></li><li>• <b>Differentiation</b></li></ul>
<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
Shape, Space and Measure (AO2) <ul style="list-style-type: none"> <li>• Properties and areas of shapes</li> <li>• Trigonometry</li> <li>• Pythagoras' theorem</li> <li>• Compound measures (speed, density)</li> <li>• Sine and Cosine rule</li> <li>• Sine area of a triangle</li> <li>• 3D Pythagoras' theorem</li> </ul>	Shape, Space and Measure (AO2) <ul style="list-style-type: none"> <li>• Angles in polygons and circles</li> <li>• Symmetry</li> <li>• Constructions</li> <li>• Volume</li> <li>• Similarity</li> <li>• Transformations</li> <li>• Circle theorems</li> <li>• Similar area and volume</li> <li>• Vectors</li> </ul>
Handling Data (AO3) <ul style="list-style-type: none"> <li>• Basic probability</li> <li>• Tree diagrams</li> <li>• Conditional probability</li> <li>• Histograms</li> </ul>	Handling Data (AO3) <ul style="list-style-type: none"> <li>• Statistical measure</li> <li>• Cumulative frequency diagrams</li> </ul>
Topics in black: studied by both Foundation and Higher Tiers students Topics in red: studied by Higher Tier students only.	



# Teaching in a Modular Way

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**.
- 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.

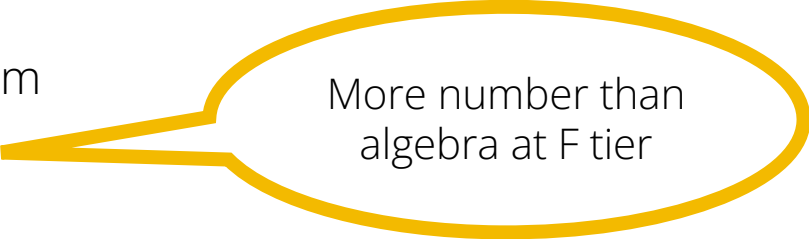
# Understanding the Assessment Objectives



# The assessment objectives for Int GCSE are described in terms of content and mathematical processes

## AO1 Demonstrate knowledge, understanding and skills in number and algebra:

- numbers and the numbering system
- calculations
- solving numerical problems
- equations, formulae and identities
- sequences, functions and graphs.




More number than algebra at F tier



More algebra than number at H tier






The assessment objectives for Int GCSE are described in terms of content and mathematical processes

AO2 Demonstrate knowledge, understanding and skills in shape, space and measures:

- geometry and trigonometry
- transformation geometry
- vectors



Only at H tier



The assessment objectives for Int GCSE are described in terms of content and mathematical processes

AO3 Demonstrate knowledge, understanding and skills in

- statistics
- probability



# Some examples of 'knowledge'

Knowledge - know facts and definitions.

Know (standard) processes

# Some examples of 'knowledge'

Knowledge - know facts

$y^2$  means  $y \times y$   This is a definition

In the evaluation of  $3 \times (6 + 4)$  the expression inside the brackets has to be worked out first.

The sum of the angles around a point is  $360^\circ$  This is a fact

The range of a set of measurements is the difference between the largest and the smallest

  
This is a definition

# Some examples of 'knowledge'

Knowledge - processes

$$15\% \text{ of } \$60 \rightarrow 60 \div 100 = 0.60 \text{ and } 0.60 \times 15 = 9$$

$$15\% \text{ of } \$60 \rightarrow 15 \div 100 = 0.15 \text{ and } 0.15 \times 60 = 9$$

$$\text{Solve } 4y - 3 = 8 - y$$

$$4y + y = 8 + 3$$

$$5y = 11$$

$$y = 11/5$$

# Some examples of 'knowledge'

Knowledge - processes

Expand and simplify  $(2y + 1)(y - 3)(y + 2)$

One approach is  $(y - 3)(y + 2) = y^2 - y - 6$

$$(2y + 1)(y^2 - y - 6) = 2y^3 - 2y^2 - 12y + y^2 - y - 6$$

$$2y^3 - y^2 - 13y - 6$$

# Some examples of 'knowledge'

Knowledge - processes

Work out the size of the internal angle of a regular decagon

One approach is  $360 \div 10 = 36$   
followed by  $180 - 36 = 144$

Of course the direct approach is also possible.

# Some examples of 'knowledge'

Knowledge - processes

The mean height of the 12 girls in a class is 160 cm  
The mean height of the 18 boys in the class is 170 cm

Quote and use  $\frac{ma + nb}{m + n}$



# Some examples of 'knowledge'

## Knowledge - processes

The mean height of the 12 girls in a class is 160 cm

The mean height of the 18 boys in the class is 170 cm

Total height of all the girls is  $12 \times 160 = 1920$  cm

Total height of all the boys is  $18 \times 170 = 3060$  cm

Total height of all the students =  $3060 + 1920 = 4980$  cm

Total number of students =  $12 + 18 = 30$

Mean height of all the students =  $4980 \div 30 = 166$  cm



# Demonstrating 'knowledge' in exams when a modern calculator is allowed

- Functionality of many inexpensive calculators
- Can carry out operations with fractions
- Can write a number as a product of its prime factors
- Can solve simultaneous equations when written in 'usual' form.
- Can solve quadratic equations when written in 'usual' form
- Can carry out operations with surds including rationalising the denominator
- Can draw algebraic graphs



# Demonstrating 'knowledge' in exams when a calculator is NOT allowed on a question

At Int GCSE these are usually signalled by

- 'Show'
- 'Use algebra to'
- 'You must show your working'
- 'Show full algebraic working'

# Demonstrating 'knowledge' in exams when a modern calculator is allowed

E.g. June 2FR 2023

Show that  $4\frac{2}{3} \div 1\frac{5}{6} = 2\frac{6}{11}$

E.g. June 1 HR 2023

Write 2250 as a product of powers of its prime factors.  
Show your working clearly.

# Demonstrating 'knowledge' in exams when a modern calculator is allowed

E.g. June 2HR 2023

(a) Expand and simplify  $(x + 6)(3x - 2)(x + 6)$

E.g. June 2H 2023

Solve the simultaneous equations

$$x + 2y = 15$$

$$4x - 6y = 4$$

Show clear algebraic working.

# Demonstrating 'knowledge' in exams when a modern calculator is allowed

E.g. June 2HR 2023

Solve the simultaneous equations

$$\begin{aligned}2y^2 + x^2 &= -6x + 42 \\ 2x + y &= -3\end{aligned}$$

Show clear algebraic working.



# Demonstrating 'knowledge' in exams when a modern calculator is allowed

## Activity 1

Demonstrating 'knowledge' when solving a quadratic equation by using the formula or by completing the square.

- The philosophy is to reward application of the process(es)
- Accurate substitution
- Correct order of working out in a correct expression
- Correct roots BUT ONLY IF there is evidence of correct processes



# Demonstrating 'knowledge' in exams when a modern calculator is allowed

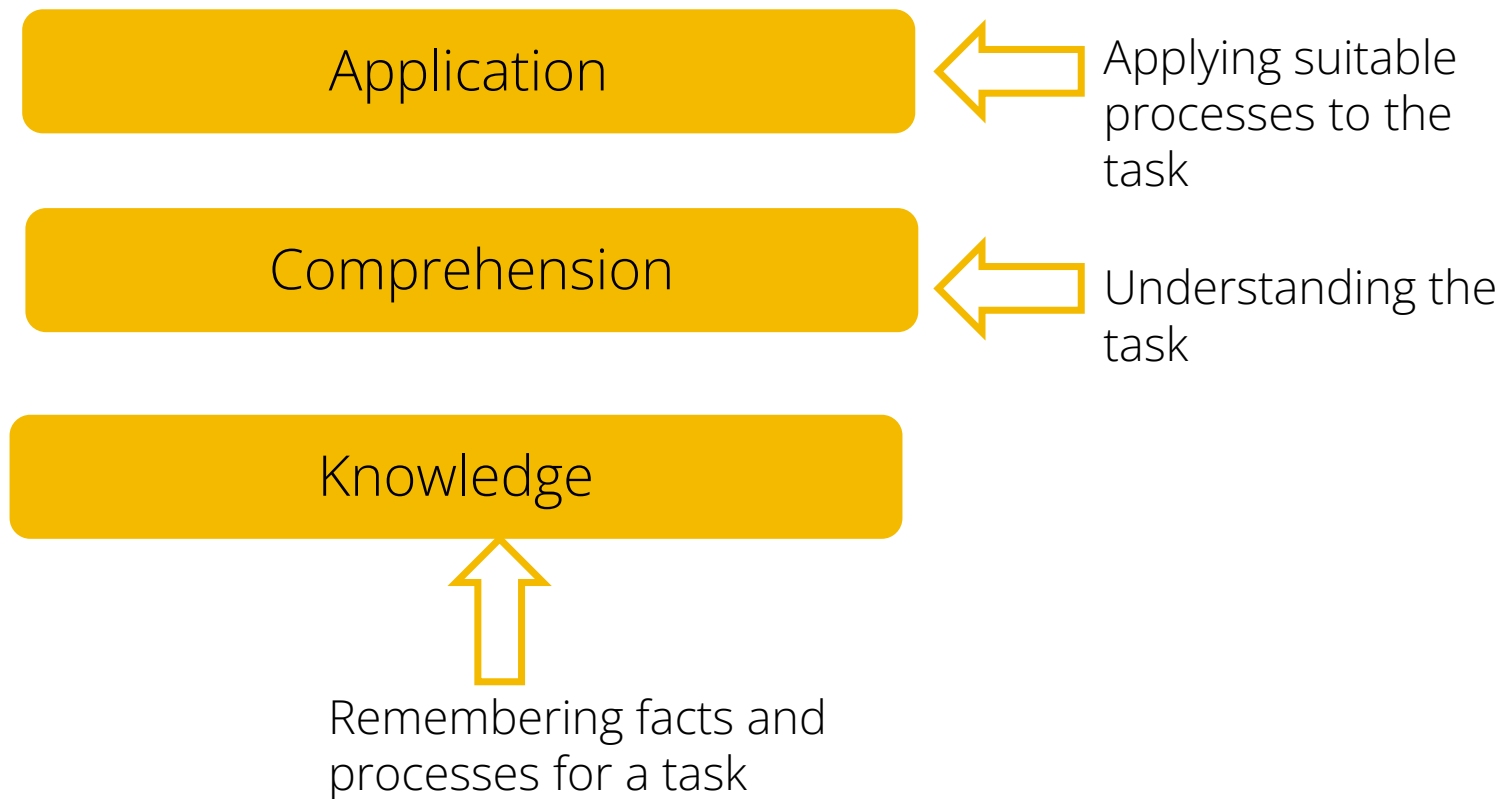
## Activity 1

Demonstrating 'knowledge' when solving a quadratic equation by using the formula or by completing the square.

- Complete the record sheet for the 6 student attempts.
- Does the attempt display knowledge of the process?

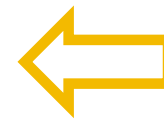


# The theoretical underpinning of the assessment objectives for Int GCSE



# The theoretical underpinning of the assessment objectives for Int GCSE

## Knowledge



Remembering facts and processes for a task

observation and recall of information  
knowledge of major ideas  
mastery of subject matter

# The theoretical underpinning of the assessment objectives for Int GCSE

Knowledge



Remembering facts and processes for a task

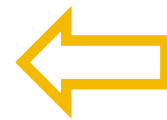
list, define, tell, describe, identify, show, label, collect, examine, tabulate, quote, name, who, when, where, etc.

These are general instruction words.  
More specifically for maths we have.....

Name, write down, simplify, solve

# The theoretical underpinning of the assessment objectives for Int GCSE

Comprehension



Understanding the task

understanding information  
grasp meaning  
translate knowledge into new context  
interpret facts, compare, contrast  
order, group, infer causes  
predict consequences

# The theoretical underpinning of the assessment objectives for Int GCSE

Comprehension



Understanding the task

summarise, describe, interpret, contrast, predict,  
associate, distinguish, estimate, differentiate, discuss,  
extend

These are general  
instruction words.  
More specifically for  
maths we have.....

Find!

# The theoretical underpinning of the assessment objectives for Int GCSE

Application



Applying suitable processes to the task

use information  
use methods, concepts, theories in new situations  
solve problems using required skills or knowledge

# The theoretical underpinning of the assessment objectives for Int GCSE

Application



Applying suitable processes to the task

apply, demonstrate, calculate, complete,  
illustrate, show, solve, examine, modify, relate,  
change, classify, experiment, discover

These are general  
instruction words.  
More specifically for  
maths we have.....

Find!



# The theoretical underpinning of the assessment objectives for Int GCSE

## Activity 2

Make a record of the demand words used in the two examination papers 4MA1/1FR and 4MA1/1HR (both Jan 2023)

Write down any comments/ observations on your results.



# The theoretical underpinning of the assessment objectives for Int GCSE

## Activity 2

Make a record of the demand words used in the two examination papers 4MA1/1FR and 4MA1/1HR (both Jan 2023)

Write down any comments/ observations on your results.

There appear to be a greater variety of command words at F

Both F and H have 'Find' and 'Work out' as the most frequent demand words

There are more 'Work out' than 'Find' at F tier  
This reverses at H tier

# Mathematical reasoning and problem solving in Int GCSE mathematics

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

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



# Mathematical reasoning and problem solving in Int GCSE mathematics

Mathematical reasoning -

- make deductions
- draw conclusions
- present arguments and proofs
- interpret information accurately
- communicate results clearly

# Mathematical reasoning and problem solving in Int GCSE mathematics

## Problem solving -

translate a situation into suitable mathematical form – then –  
carry out a suitable (possibly sequence of) mathematical process(es) – then –  
state the answer



There is some  
overlap  
between this  
and  
reasoning

# Mathematical Reasoning

Evaluation



Not really present  
in examinations

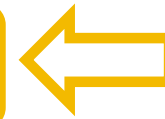
Synthesis

Present arguments  
and proofs, make  
deductions and  
draw conclusions  
from mathematical  
information.

Analysis

# Problem Solving

Evaluation



Not really present  
in examinations

Synthesis

Analysis

Translating a problem  
in a mathematical or  
non-mathematical  
context into a process  
or a series of  
mathematical  
processes and solve  
the problem.



# Problem solving in Int GCSE mathematics

Some further comments on what are the properties of a mathematical problem. A mathematical problem:

- requires use of techniques from more than one content area
- requires a succession of processes – but not just a standard set such as with simultaneous equations
- is unfamiliar so there is no **obvious** standard method of solution
- is in an unfamiliar context
- requires translation to a form which allows suitable mathematical processes to be used to solve the problem.



# Problem solving in Int GCSE mathematics

Some further comments on what are the properties of a mathematical problem.

So a question such as

Solve

$$2x + y = 6$$

$$2x^2 + y^2 = 66$$

....would NOT normally be considered a mathematical problem,  
even though many students will find it difficult.





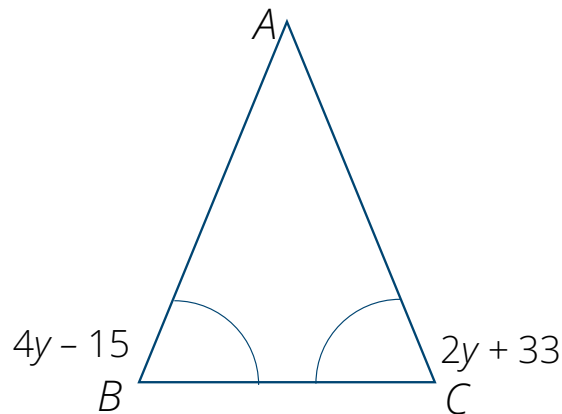
# Problem solving in Int GCSE mathematics

## Activity 3

Make up some further examples which (although possibly difficult) should **not** be considered as problem solving.

# Problem solving in Int GCSE mathematics

Translate a situation into suitable mathematical form



$$4y - 15 = 2y + 33$$

Triangle  $ABC$  is isosceles with  $AB = AC$   
Find the size of angle  $BAC$

Base angles of an isosceles triangle  
are equal

Set up an equation.

Solve the equation

Work out angles  $B$  and  $C$

Work out angle  $A$

# Problem solving in Int GCSE mathematics

Chen buys 120 watches for \$50 each.  
He sells 60% of the watches for \$80 each.  
He sells half the remaining watches for \$60 each.  
Any watches he still has left he sells for \$50 each

Work out the percentage profit.

Work out the initial total cost  
Work out the income from the first 60%  
Work out the income from the remainder  
Work out the percentage profit

# Problem solving in Int GCSE mathematics

Find the sum of all the multiples of 3 which are less than 1000

First task – recognise this is a Q about arithmetic series

Second task – work out how many terms

Third task – work out the sum of the arithmetic series



# Problem solving in Int GCSE mathematics

## Activity 4

There are 5 questions from two Jan papers.  
Work through the questions:

Make a decision of whether each question is a problem or not.

If it is a problem, decide on what aspects of the question makes it a problem.

# Problem solving in Int GCSE mathematics

## Activity 4

There are 5 questions from two Jan papers.  
Work through the questions:

Make a decision of whether each question is a problem or not  
If it is a problem, decide on what aspects of the question makes it a problem.

### A. June 2023

This had no marks for problem solving. It is a standard set of processes.

### B. January 2023

This is a classic problem-solving question and had all 5 marks set against it for problem solving

# Problem solving in Int GCSE mathematics

## Activity 4

There are 5 questions from two Jan papers.  
Work through the questions:

Make a decision of whether each question is a problem or not  
If it is a problem, decide on what aspects of the question makes it a problem.

C. January 23

This had all 3 marks set against AO1 only. No problem solving marks.

D. June 23

This is a straightforward application of the Intersecting Chords Theorem. No marks were set against problem solving.

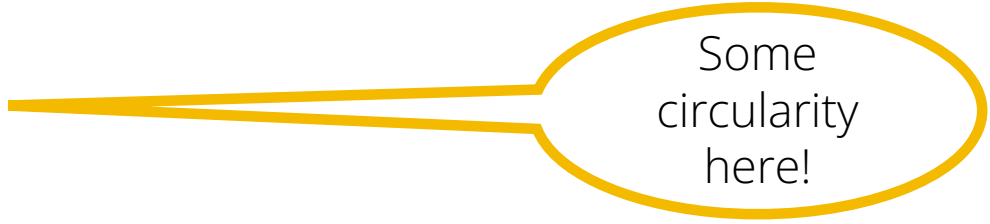
E. June 23

All 3 marks were set against problem solving.

# Reasoning in Int GCSE mathematics

Reasoning involves these characteristic processes:

- making deductions and drawing conclusions from mathematical information
- constructing chains of reasoning
- presenting arguments and proofs
- interpreting and communicating information accurately.



Some  
circularity  
here!





# Reasoning in Int GCSE mathematics

Reasoning involves these characteristic processes

- making deductions and drawing conclusions from mathematical information
- Carrying out a calculation to answer a yes/no question

In a car sale all normal prices have been reduced by 12%.

- The normal price of a car Omar likes is \$24000
- Omar has \$20000
- Does he have enough money to buy the car in the sale?

# Reasoning in Int GCSE mathematics

constructing chains of reasoning

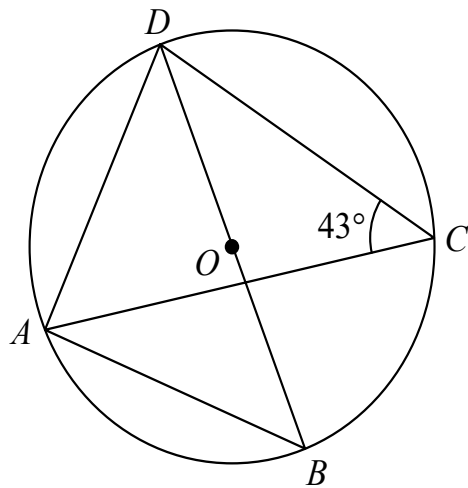


Diagram **NOT**  
accurately drawn

This will  
always be  
counted as  
reasoning

Work out the size of angle  $ADB$ .  
Give a reason for each stage in your working.

# Reasoning in Int GCSE mathematics

Presenting arguments and proofs

Line **L**<sub>1</sub> has equation  $y = 3x + 5$   
Line **L**<sub>2</sub> has equation  $6y + 2x = 1$

Show that **L**<sub>1</sub> is perpendicular to **L**<sub>2</sub>


Students do not  
have to PROVE the  
rule  
 $m_1 \times m_2 = -1$

They just have to  
show that in this  
case the gradients  
do satisfy that rule.

# Reasoning in Int GCSE mathematics

Presenting arguments and proofs

Helena thinks that any number of the form  $2^n + 3$  is always a prime number when  $n$  is a whole number. Give an example to show that Helena is wrong.



The term  
'counterexample'  
does not appear in  
the specification

# Reasoning in Int GCSE mathematics

Presenting arguments and proofs

Show that  $1\frac{2}{3} + 2\frac{3}{4} = 4\frac{5}{12}$

Enough working has to be shown to demonstrate knowledge of the process of adding fractions

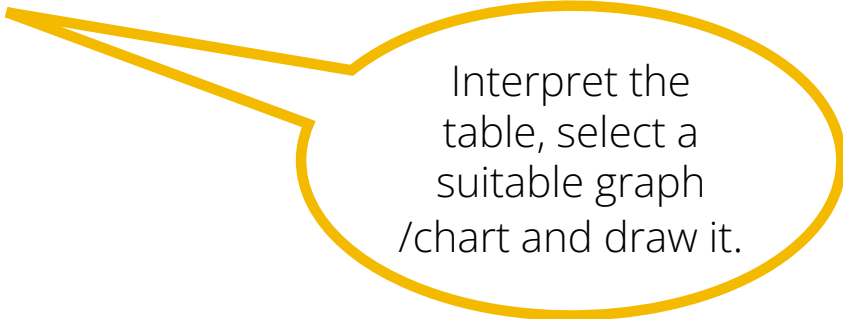
# Reasoning in Int GCSE mathematics

Interpreting and communicating information accurately.

The table shows the average monthly temperatures, in  $^{\circ}\text{C}$ , for four months in London and in Cairo.

	January	April	July	October
London ( $^{\circ}\text{C}$ )	5	11	19	13
Cairo ( $^{\circ}\text{C}$ )	14	21	28	23

Show this information by drawing a suitable diagram on the grid below.



Interpret the table, select a suitable graph /chart and draw it.



# Lunch



# Reasoning in Int GCSE mathematics

## Activity 5

- There are 5 questions from two January papers.
- Work through the questions:
- Make a decision of whether each question is a reasoning question or not
- If it is a reasoning question, decide on what aspects of the question makes it so.





# Reasoning in Int GCSE mathematics

## Activity 5

There are 5 questions from two January papers.  
Work through the questions.

Some ideas are answer/comments sheet.

There are some questions where there is some flexibility in the allocation of reasoning v problem solving



# Reasoning in Int GCSE Mathematics

- A. No marks were given on this question as reasoning. It is a simple Venn diagram
- B. This is a complex simplification and all 5 marks were set against reasoning here.
- C. One mark [the final mark] was set against reasoning. 'Explain' a statement etc is always reasoning.
- D. Two marks were allocated to reasoning in this question. 'Give a reason' is always going to be a reasoning mark.
- E. All 6 marks were allocated against Reasoning. Making deductions from mathematical information, interpreting and communicating information accurately



# Constructing Int GCSE mathematics papers

The 'other' factor not mentioned so far is – demand

'Demand' is not the focus of this course but since it plays a significant role in papers we will look at it briefly



# Constructing Int GCSE mathematics papers

We can say that the demand of a question is similar to its difficulty

But that does not really help.

We can try to make subjective/ qualitative judgements

e.g. a hierarchy of equations to solve

Single linear, unknown on one side

Single linear, unknown on both sides

Simultaneous linear equations

Simultaneous equations, one linear, one quadratic.



# Constructing Int GCSE mathematics papers

Or – we could look at the vast amount of data that Edexcel collects on responses to each question as a product of the online marking system.

Or – we could write questions, pre-test them and construct a question bank

However, there is a health warning with both of these approaches:

Which forms the basis of **Activity 6**



# Constructing Int GCSE mathematics papers

## Activity 6

There are several question which all are based on the Theorem of Pythagoras.

Put the questions in increasing order of difficulty and add a comment about the demand of each one which you used to make your decision.

# Constructing Int GCSE mathematics papers

## Activity 6

There are several question which all are based on the Theorem of Pythagoras.

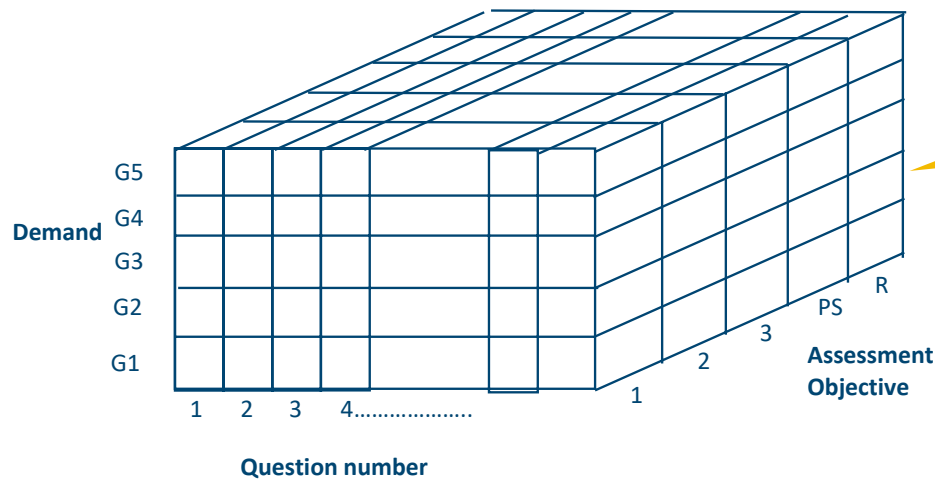
1 = easiest, 8 = most difficult

A	B	C	D	E	F	G	H
2	3	1	4	7	5	6	8

Great reliance (and responsibility) is placed on the paper setting team to get the level of demand consistent from session to session and to set questions which accurately reflect the demands of the different levels.

# Constructing Int GCSE mathematics papers

A schematic diagram of the Foundation paper setting grid.



There are approximately  $5 \times 5 \times 20 = 500$  cells to fill with marks subject to various conditions.



# Constructing Int GCSE mathematics papers

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

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.



# Constructing Int GCSE mathematics papers

## Activity 7

This has the overlap questions between the F tier paper and the H tier paper for June 2023 (and a little more)

(47 marks)

Complete the grid to show how the marks have been distribution across the 3 AOs and identify marks for reasoning and for problem solving.

The totals for the AOs and reasoning and problem solving are shown.



# Constructing Int GCSE mathematics papers

## Activity 7

This has the overlap questions between the F tier paper and the H tier paper for June 2023 (and a little more)

(47 marks)

- Here is the grid that was actually used.
- How much did you agree?

# Constructing Int GCSE mathematics papers

The actual AOG used on this paper 1H January 2023

Specification level and title				Unit and Paper Number	GCE *	Total mark	100							
IGCSE Mathematics A				4MA11H	(I)GCSE untiered*			Mark allocation per AO according to the Specification						
Qu.No	Specification Content Reference / Topic Area / Sub Topic					Marks	AO1		AO2	AO3	Problem solving	Math reason		
	Spec Ref	Description			Marker		Number	Algebra	SSM	HD				
1	F6.2C	Estimate the mean from grouped data			1	4				4				
2	F2.4A	Solving an equation			1	3		3				3		
3	F4.5D	Bisector			1	2			2					
4	F4.2DE	Pentagon			1	3			3					
5	F1.7AB	Ratio 3 parts			1	3	3				3			
6	F1.6EF	Percentage increase/Reverse percentage			1,1	7	7							
7	F6.3HIJ	Number of books			1	4				4	4			
8	F4.8BC, F4.9E	Trigonometry and semicircle			1	5			5		5			
9	F1.9A	Standard form			3,2	3	3							
10	F2.2F, F2.8BC	Quadratic and inequality			2,2,1	6		6				1		
11	H2.8B	Recognising inequalities from a graph			1	3		3				3		
12	H1.4C	Negative and fractional indices			3,3	2	2							
13	H2.2A	Expansion of 3 brackets			1	3		3				3		



# Improving student's ability in reasoning and problem solving

Here are some suggestions:

- start them young!
- use suitable processes in class where possible (e.g. questioning for reasoning)
- set single tasks which may require students to work at length
- find and use suitable resources
- set single tasks which may require students to work at length
- old Edexcel coursework GCSE tasks are an excellent source.



# Improving student's ability in reasoning and problem solving

Here are some more suggestions:

- Build into the faculty plan the importance of reasoning and problem solving permeating maths lessons
- Make sure that any assessments (e.g. end of term tests) have questions on reasoning and problem solving
- Insist that students provide reasons in all geometry problems (even if the question does not ask for it)
- Encourage different approaches (where possible) in solving a problem



# Improving student's ability in reasoning and problem solving

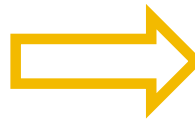
Here are some more suggestions:

- improve student's knowledge of the mathematics they meet – short tests, short questions – increases fluency
- Old Edexcel coursework GCSE tasks are an excellent source.
  - e.g. 6 papers covering various aspects of problem solving and reasoning (for IGCSE) on the Edexcel site.
  - e.g. adapt 'standard' questions to make them problem solving

# Improving student's ability in reasoning and problem solving

Adapting 'standard' questions to make them problem solving.

$x$	$f$
0	7
1	8
2	9
3	10
4	6
5	2



$x$	$f$
0	$a$
1	8
2	9
3	10
4	6
5	2

Calculate the mean value of  $x$

Given that the mean value of  $x$  is 2.25, find the value of  $a$

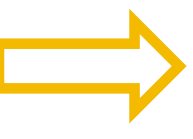


# Improving student's ability in reasoning and problem solving

Adapting 'standard' questions to make them problem solving.

Solve  $x^2 - 4x - 6 = 0$   Solve  $(x - 3)^2 - 4(x - 3) - 6 = 0$

Solve  $x^2 - 4x - 6 = 0$   Given  $x^2 - ax - a^2 = 0$   
express  $x$  in terms of  $a$

Solve  $x^2 - 4x - 6 = 0$   Given  $y = x^2 - 4x - 6$   
Express  $x$  in terms of  $y$

# Transitioning to IAL

## Bridging the gap!



# Key IGCSE Topics for IAL Transition

Algebraic skills

- Solving quadratics
- Simultaneous equations (including linear with non-linear)
- Surds and indices
- Manipulating algebraic fractions

Advanced trigonometry

Transformation of functions

Algebraic proof

Differentiation

# Advanced Trigonometry

International GCSE

IAS

The diagram shows a kite  $ABCD$

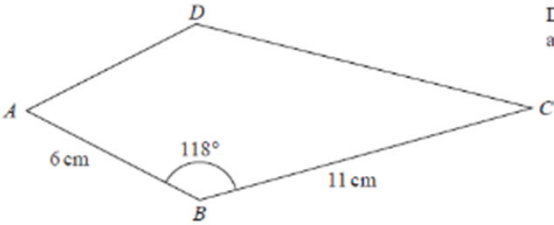


Diagram NOT  
accurately drawn

$AB = 6\text{ cm}$        $BC = 11\text{ cm}$       Angle  $ABC = 118^\circ$

Calculate the area of the kite.  
Give your answer correct to 3 significant figures.

.....  $\text{cm}^2$

(Total for question = 3 marks)

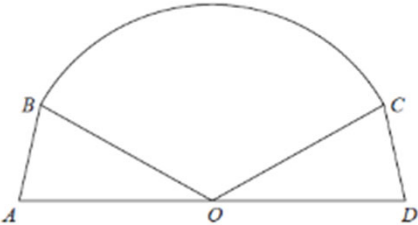


Diagram NOT  
accurately drawn

Figure 1

Figure 1 shows the plan view for the design of a stage.  
The design consists of a sector  $OBC$  of a circle, with centre  $O$ , joined to two congruent triangles  $OAB$  and  $ODC$ .  
Given that

- angle  $BOC = 2.4$  radians
- area of sector  $BOC = 40\text{ m}^2$
- $AOD$  is a straight line of length  $12.5\text{ m}$

(a) find the radius of the sector, giving your answer, in  $\text{m}$ , to 2 decimal places,

(2)

(b) find the size of angle  $AOB$ , in radians, to 2 decimal places.

(1)

Hence find

(c) the total area of the stage, giving your answer, in  $\text{m}^2$ , to one decimal place,

(3)

(d) the total perimeter of the stage, giving your answer, in  $\text{m}$ , to one decimal place.

(4)

(Total for question = 10 marks)

# Transformation of Functions

International GCSE

IAS

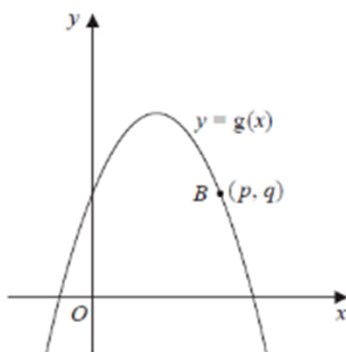
The point  $A$  with coordinates  $(-3, 2)$  lies on the straight line with equation  $y = f(x)$

(a) Find the coordinates of the image of the point  $A$  on the straight line with equation

(i)  $y = f(x) - 3$

(ii)  $y = f\left(\frac{x}{2}\right)$

Here is a sketch of part of the curve with equation  $y = g(x)$



The point  $B$  with coordinates  $(p, q)$  lies on the curve.

(b) Find the coordinates of the image of the point  $B$  on the curve with equation

$$y = -g(x - c)$$

where  $c$  is a constant.

(a) Sketch the graph of the curve  $C$  with equation

$$y = \frac{4}{x - k}$$

where  $k$  is a positive constant.

Show on your sketch

- the coordinates of any points where  $C$  cuts the coordinate axes
- the equation of the vertical asymptote to  $C$

(4)

Given that the straight line with equation  $y = 9 - x$  does not cross or touch  $C$

(b) find the range of values of  $k$ .

(5)

(Total for question = 9 marks)

# Algebraic Proof

International GCSE

Prove that the difference between two consecutive square numbers is always an odd number.  
Show clear algebraic working.

IAS

(i) Use algebra to prove that for all real values of  $x$

$$(x - 4)^2 \geq 2x - 9$$

(3)

(ii) Show that the following statement is untrue.

$2^n + 1$  is a prime number for all values of  $n$ ,  $n \in \mathbb{N}$

(1)

**(Total for question = 4 marks)**

# Differentiation

International GCSE

The curve **T** has equation  $y = x^3 - 2x^2 - 9x + 15$

(a) Find  $\frac{dy}{dx}$

$\frac{dy}{dx} = \dots\dots\dots$  (2)

(b) Find the range of values of  $x$  for which **T** has a positive gradient.  
Give your values correct to 3 significant figures.  
Show your working clearly.

IAS

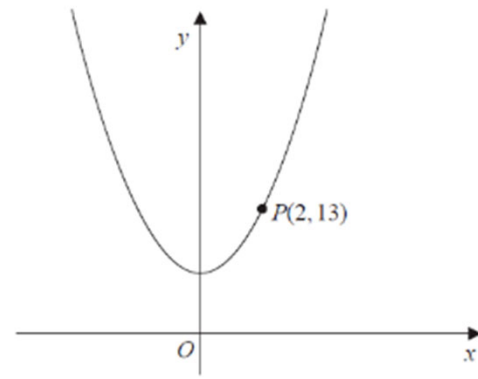


Figure 4

Figure 4 shows part of the curve with equation  $y = 2x^2 + 5$

The point  $P(2, 13)$  lies on the curve.

(a) Find the gradient of the tangent to the curve at  $P$ . (2)

The point  $Q$  with  $x$  coordinate  $2 + h$  also lies on the curve.

(b) Find, in terms of  $h$ , the gradient of the line  $PQ$ . Give your answer in simplest form. (3)

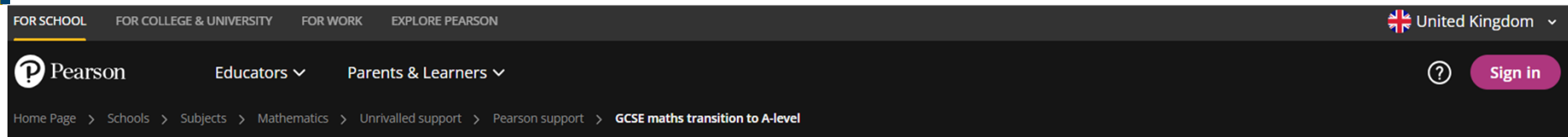
(c) Explain briefly the relationship between the answer to (b) and the answer to (a). (1)

(Total for question = 6 marks)

# Transition Resources



# IAL Transition Resources - [Link](#)



## Free videos to assist the transition from GCSE to A level Maths

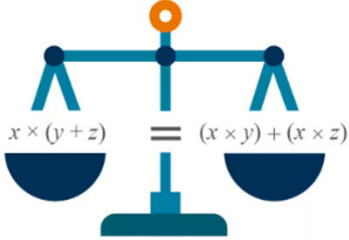


The transition from GCSE to A level Maths can be challenging but, with plenty of practice, it most certainly is a rewarding experience. The chapters below focus on activities which help students to master the key skills that are needed in both AS and A level Mathematics. The topics are mainly those found in the overlap between GCSE and AS mathematics.

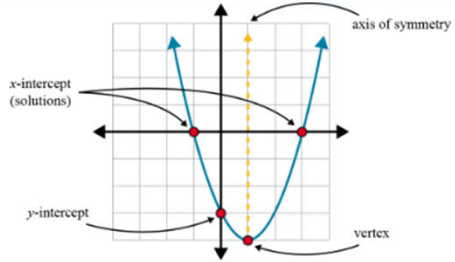
Each chapter contains between 10 and 15 videos for students to watch, along with a downloadable PDF of example questions, practice questions and End of chapter exam questions for consolidation.

Please download the [Instruction guide \(PDF | 940.76 KB\)](#) for guidance on how to use this resource.

Please note: we have deliberately not included Chapter 8 and some of the examples, for more information [please read our FAQs below](#)



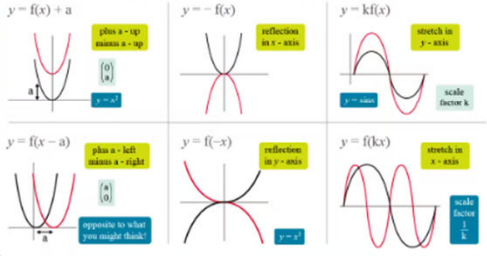
Chapter 1 - Algebraic expressions



Chapter 2 - Quadratics

**Equations**  
 $x = 4 + y$   
**Inequalities**  
 $x > y - 6$   
**Function**  
 $y = 3x - 2$

Chapter 3 - Equations and inequalities

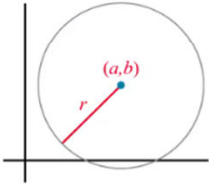


Chapter 4 - Graphs and transformations

$$y = mx + c$$

$$y - y_1 = m(x - x_1)$$

Chapter 5 - Straight line graphs

$$(x - a)^2 + (y - b)^2 = r^2$$


Chapter 6 - Circles

# Chapter 1 - Algebraic Expressions


Chapter 1 covers the topic of Algebraic Expressions. Don't forget to follow the steps below:

1. Download and complete the [example questions \(PDF | 296.7 KB\)](#) for each chapter
2. Watch the video to check your solution
3. Once you have completed the question and watched the video, try the practice questions to help consolidate that skill and concept.
4. Once you have done this for all examples in the chapter, try the End of Chapter Exam Questions.



## Index Laws - Section 1.1


Step 1. Watch the video below.


 A level Mathematics - Ch 1 Section 1.1 Index Laws  
Edexcel

### Chapter 1 - Video 1 of 13 Algebraic Expressions

**Section 1.1  
Index laws**

Short videos on topics to help students transition to A level Maths

Watch on  YouTube



Copy link

Step 2. Move on to the next example.

## Example 1 – Simplifying expressions

Step 1. Complete example 1 from the [chapter 1 example question document \(PDF | 296.7 KB\)](#)

Step 2. Watch the video below to check your solution:

A level Mathematics – Ch 1 Ex 1 Simplifying expressions

Example 1

Simplify these expressions:

a  $x^2 \times x^5$     b  $2r^2 \times 3r^3$     c  $\frac{b^7}{b^4}$     d  $6x^5 \div 3x^3$     e  $(a^3)^2 \times 2a^2$     f  $(3x^2)^3 \div x^4$

$= x^7$      $2 \times 3 \times r^2 \times r^3 = 6r^5$      $b^3$      $\frac{6x^5}{3x^3} = 2x^2$      $a^6 \times 2a^2 = 2a^8$      $= 27x^4$

MORE VIDEOS

1:57 / 2:59

YouTube

Step 3. Complete the practice questions:

[Simplifying expressions practice questions \(PDF | 487KB\)](#) (PDF | 487.03 KB)

Step 4. Move on to the next example.

## Simplifying expressions

### A LEVEL LINKS

Scheme of work: 1a. Algebraic expressions – basic algebraic manipulation, indices and surds

### Key points

- $a^m \times a^n = a^{m+n}$
- $\frac{a^m}{a^n} = a^{m-n}$
- $(a^m)^n = a^{mn}$
- $a^0 = 1$
- $a^{\frac{1}{n}} = \sqrt[n]{a}$  i.e. the  $n$ th root of  $a$
- $a^{\frac{m}{n}} = \sqrt[n]{a^m} = (\sqrt[n]{a})^m$
- $a^{-n} = \frac{1}{a^n}$
- The square root of a number produces two solutions, e.g.  $\sqrt{16} = \pm 4$ .

**Example 1** Simplify  $\frac{x^5}{x^2}$

$\frac{x^5}{x^2} = x^3$	use the rule $\frac{a^m}{a^n} = a^{m-n}$ to give $\frac{x^5}{x^2} = x^{5-2} = x^3$
-------------------------	---

**Example 2** Simplify  $6x^6 \times 3x^4$

$6x^6 \times 3x^4 = 18x^{10}$	$6 \times 3 = 18$ and then use the rule $a^m \times a^n = a^{m+n}$ to give $x^6 \times x^4 = x^{6+4} = x^{10}$
-------------------------------	--

**Example 3** Simplify  $(x^4)^2 \times 3x^5$

$(x^4)^2 \times 3x^5 = 3x^{13}$	$3 \times 1 = 3$ and then use the rule $(a^m)^n = a^{mn}$ following by to give $a^m \times a^n = a^{m+n}$ $(x^4)^2 \times x^5 = x^{4 \times 2} \times x^5$ $= x^8 \times x^5$ $= x^{8+5}$ $= x^{13}$
---------------------------------	--

### Practice questions

- (a) Simplify  $a^4 \times a^5$  .....

(b) Simplify  $\frac{45e^6 f^8}{5ef^2}$  .....

(c) Write down the value of  $9^{\frac{1}{2}}$  .....
- (a) Simplify  $x^7 \times x^3$  .....

(b) Simplify  $(m^4)^3$  .....

(c) Simplify  $\frac{36af^8}{12a^5 f^2}$  .....
- (a) Simplify  $(p^3)^2$  .....

(b) Simplify  $\frac{t^8}{t^3}$  .....
- Simplify  $(3x^2 y^4)^3$  .....

# Understanding Mark Schemes



# Understanding mark schemes – marking activities

## Mark codes

M. marks are awarded for a correct application of a method, or a correct attempt.

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 – marking activities

## 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





# Understanding mark schemes – marking activities

## Activity 8

There are 4 candidate responses for you to mark. Use only the scheme and write the marks you award at the point you award them. This question comes from June 2023 4MA1 paper.

# Understanding mark schemes – marking activities

Question 3 4MA1H June 2023

**3 Nanette buys 60 notebooks for a total cost of 780 dirhams.**

**Nanette sells 70% of the notebooks for 22 dirhams each.  
She sells the remaining notebooks for 19 dirhams each.**

**Work out Nanette's percentage profit.  
Give your answer correct to 3 significant figures.**

# Understanding mark schemes – marking activities

## Mark Scheme

3	$0.7 \times 60 \times 22 (= 924)$ oe <b>or</b> $(1 - 0.7) \times 60 \times 19 (= 342)$ oe <b>OR</b> $0.7 \times 60 \times \left(22 - \frac{780}{60}\right) (= 378)$ oe <b>or</b> $(1 - 0.7) \times 60 \times \left(19 - \frac{780}{60}\right) (= 108)$ oe		4	M1 for finding income for the 22 dirhams notebooks <b>or</b> the 19 dirhams notebooks <b>OR</b> for finding the profit for the 22 dirhams notebooks <b>or</b> the 19 dirhams notebooks
	$0.7 \times 60 \times 22 (= 924)$ oe <b>and</b> $(1 - 0.7) \times 60 \times 19 (= 342)$ oe <b>OR</b> $0.7 \times 60 \times \left(22 - \frac{780}{60}\right) (= 378)$ oe <b>and</b> $(1 - 0.7) \times 60 \times \left(19 - \frac{780}{60}\right) (= 108)$ oe			M1 for finding income for the 22 dirhams notebooks <b>and</b> the 19 dirhams notebooks <b>OR</b> for finding the profit for the 22 dirhams notebooks <b>and</b> the 19 dirhams notebooks, 1266 <b>or</b> 486 implies M2
	eg $\frac{"924"+"342"-780}{780} \times 100$ <b>or</b> $\frac{"924"+"342"}{780} \times 100 - 100$ <b>or</b> $\frac{"378"+"108"}{780} \times 100$ <b>or</b> $\frac{486}{780} \times 100$			M1 for a complete method to find percentage profit
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	62.3		A1 awrt 62.3, allow 62 from correct working
				<b>Total 4 marks</b>

# Understanding mark schemes – marking activities

## Attempt 1

M1M1 for finding income for both sets of notebooks (1266 or 486 implies M2)  
M0A0 no further  
marks gained as student has divided by 1266 instead of 780

## Attempt 2

M1M1 for finding income for both sets of notebooks (1266 or 486 implies M2)  
M1 for  $486/780 \times$   
100 - we don't see the  $\times 100$  but this is implied from  $0.62 = 62\%$   
A1 we will allow an answer of  
62% from correct working

## Attempt 3

M1M1 for finding income for both sets of notebooks (1266 or 486 implies M2)  
M0A0 no further  
marks gained as student has divided 780 by 1266 which is an incorrect method  
NOTE: this  
incorrect method leads to 61.6% which rounds to 62%, as does the correct answer of 62.3%. We  
will  
allow an answer of 62% as long as not from incorrect working.



# Understanding mark schemes – marking activities

## Activity 9

There are 4 more candidate responses for you to mark. This question comes from June 2023 4MA1 Higher paper

# Understanding mark schemes – marking activities

Q22 4MA1 June 2306

22 The diagram shows two circles with centre  $O$  and a regular pentagon  $ABCDE$

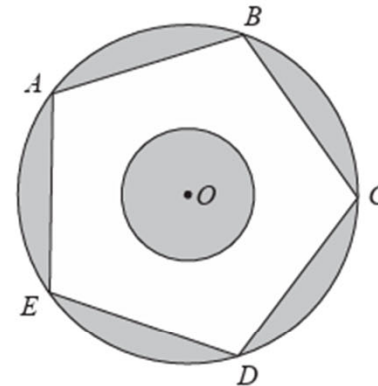


Diagram **NOT**  
accurately drawn

$A$ ,  $B$ ,  $C$ ,  $D$  and  $E$  are points on the larger circle.  
The pentagon has sides of length 8 cm.

The diagram is shaded such that

shaded area = unshaded area

Work out the radius of the smaller circle.  
Give your answer correct to 3 significant figures.

# Understanding mark schemes – marking activities

22	(radius of large circle =) $\frac{4}{\cos 54}$ <b>or</b> $\frac{4}{\sin 36}$ <b>or</b> $\frac{8 \sin 54}{\sin 72}$ <b>or</b> $\sqrt{\frac{8^2}{2-2 \cos 72}}$ (= 6.805...) <b>or</b> (height of 1 triangle within pentagon =) $4 \tan 54$ (=5.505...) oe		6	M1 for a complete method to find the radius of the large circle <b>or</b> the perpendicular height of one triangle within the pentagon
	(area of large circle =) $\pi \times ("6.805...")^2$ (= 145.489...) oe <b>or</b> (area of sector =) $\frac{72}{360} \times \pi \times ("6.805...")^2$ (= 29.097...) oe			M1 for a complete method to find the area of the large circle <b>or</b> the area of a sector of the large circle
	(area of pentagon =) $5 \times \frac{1}{2} \times 8 \times "5.505..."$ (= 80tan54 = 110.11...) <b>or</b> $10 \times \frac{1}{2} \times 4 \times "5.505..."$ (= 80tan54 = 110.11...) <b>or</b> $5 \times \frac{1}{2} \times "6.805..." \times "6.805..." \times \sin 72$ (= 110.11...) oe <b>OR</b> (area of one triangle =) $\frac{1}{2} \times 8 \times "5.505..."$ (= 22.022...) <b>or</b> $\frac{1}{2} \times "6.805..." \times "6.805..." \times \sin 72$ (= 22.022...) <b>or</b> $\frac{1}{2} \times "6.805..." \times 8 \times \sin 54$ (= 22.022...) oe			M1 for a complete method to find the area of the pentagon <b>OR</b> the area of one triangle eg <i>OED</i> or equivalent
	"145.489..." - "110.11..." + $\pi r^2$ = "110.11..." - $\pi r^2$ oe <b>or</b> $5 \times ("29.097..." - "22.022...") + \pi r^2 = 5 \times "22.022..." - \pi r^2$ oe			M1 for a correct equation for the radius of the smaller circle
	$2\pi r^2 = 2 \times "110.11..." - "145.489..."$ (= 74.731...) oe			M1 for a correct rearranged equation with the area of the circle the subject or better
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	3.45		A1 accept 3.43 – 3.45
				<b>Total 6 marks</b>

# Understanding mark schemes – marking activities

## Attempt 1

M1 for finding the radius of the large circle

M1 for finding the area of the large circle

or the area of a sector of the large circle

M1 for complete method to find the area of  
the pentagon or the area of one triangle

M0M0A0 no correct equation for the radius of the

smaller circle - they have worked with sectors but failed to multiply the area of one segment by 5  
when setting up their equation

## Attempt 2

M1 for finding the radius of the large circle or for finding the height of 1 triangle within the  
pentagon (= 5.5055 near the bottom of the page)

M1 for finding the area of the large circle

M1 for complete method to find the area of the pentagon or one triangle (= 22.022)

M0 no

correct equation for the radius of the smaller circle - the student almost has a correct method but  
has used the wrong value near the end for  $\pi r^2$

M0A0



# Understanding mark schemes – marking activities

## Attempt 3

M1 for finding the radius of the large circle

M1 for method for finding the area of a sector of the large circle

M1 for complete method to find the area of the pentagon or the area of one triangle

M0M0A0 no correct equation for the radius of the smaller circle - they are missing a 2 before  $\pi r^2$



# 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 <b>Maths Emporium</b> 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

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### Course materials

**FILTERS**

**CATEGORIES**

- ☒ Specification and sample assessments (4) [EXPAND ALL](#)
- ☐ 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)


**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 world-class 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

[Autumn teaching maths update | 12 October 2023](#)

[Getting Ready for Results Day | 18 July 2023](#)

[July teaching maths update | 4 July 2023](#)

[See more](#)

### Your Maths team

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**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>

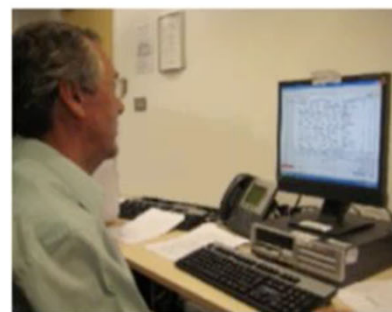
# ResultsPlus



**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*		✓	

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

# Pearson published resources

## Student Book

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

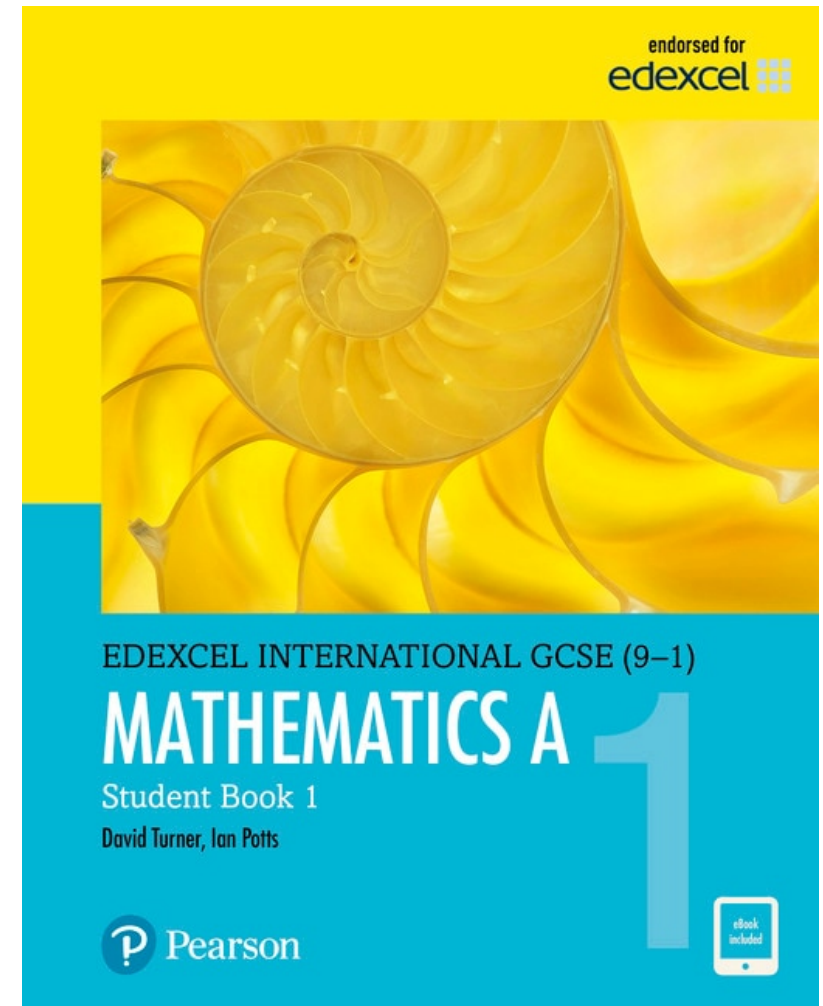
ISBN: 9780435181444

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

ISBN: 9780435183059

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International GCSE (9–1)

TeachingHubs

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# Contact your dedicated Subject Advisor

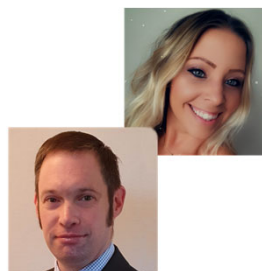
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# Questions



# Pearson