PEARSON EDEXCEL INTERNATIONAL GCSE (9-1)

Mathematics A & B

Welcome to Pearson: Module 2

First teaching in 2017, first assessment in 2019.

Your trainer today is:

Session Objectives

- Welcome to Pearson.
- Understanding Assessment Objectives.
- Understanding how the content is assessed.
- Understanding the different types of questions.
- Understanding how examination questions are marked.
- Teaching examination technique.

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Poll

1. Have you prepared students for Pearson qualifications in the past?
2. On a scale of 1 – 10 how familiar are you with the Pearson International GCSE qualification 4MA1?
3. On a scale of 1 – 10 how familiar are you with the Pearson International GCSE qualification 4MB1?

(1 = not at all familiar and 10 = very familiar)

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Welcome to Pearson Edexcel

Welcome to Pearson Edexcel,
the world's leading learning company
and the UK's largest awarding body.

We set the standard for worldwide recognised qualifications, built on the UK educational system and accepted by universities worldwide.

We have a simple mission:
to help make a measurable impact on improving people's lives through learning.

"We judge ourselves – and invite others to judge us – not by the products that we make but by the impact on learners."

John Fallon,
Chief Executive Officer, Pearson

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About Pearson Edexcel

- As the UK's largest awarding organisation, we are best placed to provide qualifications that are most closely aligned to the British educational system.
- We are the most reliable awarding organisation in the UK, recognised and trusted by educators, learners and employers to provide high quality qualifications.
- By helping you to realise student potential, you can prepare and empower all your students to progress to further education, university and employment.
- Our technology capability allows us to provide you with more advanced support services, tools and resources to make life easier for school leaders, teachers and students.
- Pearson Edexcel are leading the way, challenging thinking and creating new ideas so you can be confident our qualifications will always be world-class.

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Understanding how the content is assessed

4MA1

What are 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
- Transformation geometry [and Vectors – Higher tier only]

(22 – 28%)

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

- Statistics and probability

(12 - 18%)

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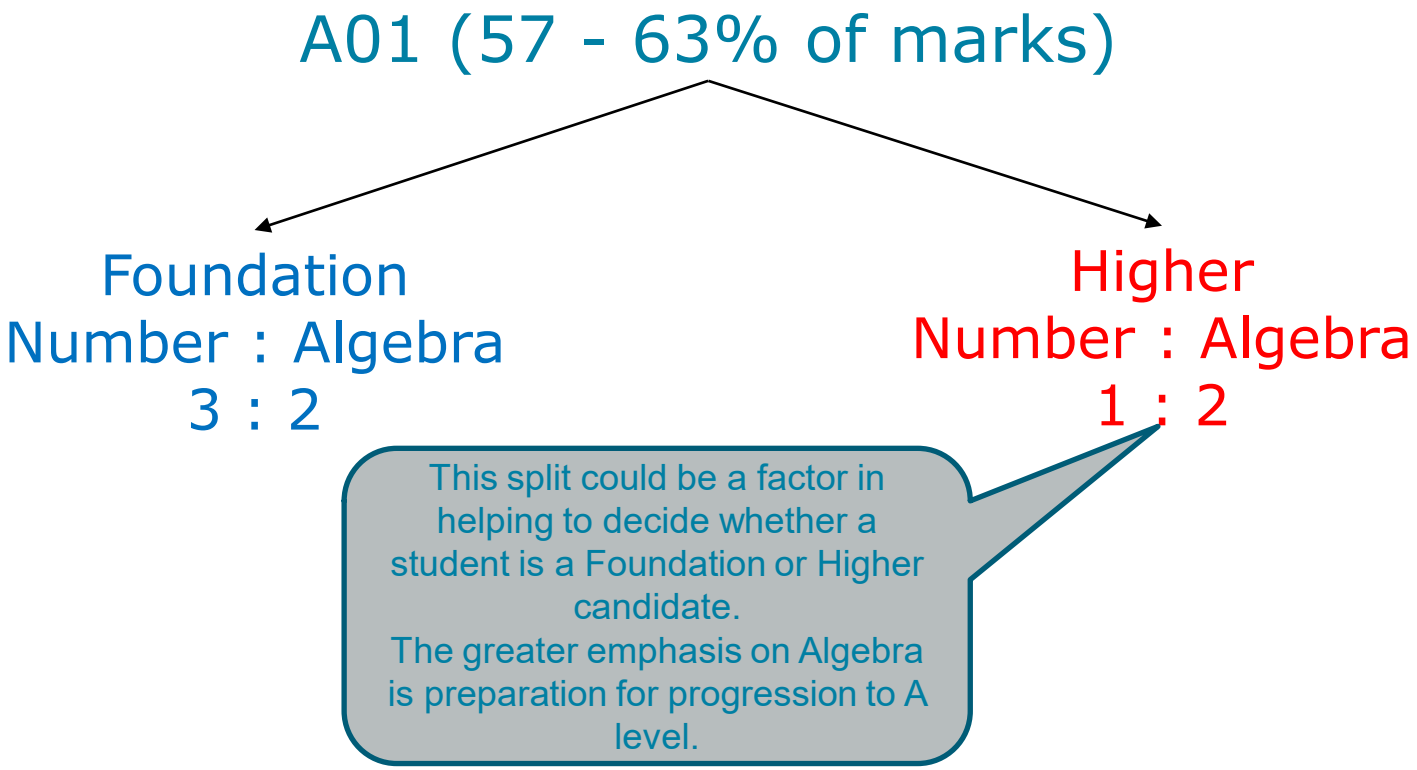
Relationship of assessment objectives to units

Unit number 4MA1	Assessment objective		
	AO1	AO2	AO3
Papers 1F and 2F	28.5–31.5%	11–14%	6–9%
Papers 3H and 4H	28.5–31.5%	11–14%	6–9%
Total for International GCSE	57–63%	22–28%	12–18%

A01 Split for Foundation and Higher



How the content is assessed: 4MA1

Paper 1	Paper 2
•Externally assessed •Availability – January and June 50% of the total International GCSE	•Externally assessed •Availability – January and June 50% of the total International GCSE

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Paper 1F and 2F – Foundation Tier

Content	Assessment
Assesses **all the content** in Foundation tier specification. Questions may come from any topic area from the Assessment Objectives across the specification (including questions that address more than one topic).	•Each paper is assessed through a 2-hour examination set and marked by Pearson. •Each paper is weighted at 50% of the qualification. •Each paper will assess the full range of targeted grades at Foundation Tier (1 – 5) •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. •The paper will be distributed evenly over all grades (20% per grade) •The total number of marks is 100. •A calculator is allowed in both papers.

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Paper 1H and 2H – Higher Tier

Content	Assessment
Assesses **all the content** in the Higher tier specification. Questions may come from any topic area from the Assessment Objectives across the specification (including questions that address more than one topic).	•Each paper is assessed through a 2-hour examination set and marked by Pearson. •Each paper is weighted at 50% of the qualification. •Each paper will assess the full range of targeted grades at Higher Tier (4 – 9) •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. •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 •The total number of marks is 100. •A calculator is allowed in both papers.

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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

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4MB1

What are 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%)

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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%

How the content is assessed: 4MB1

Paper 1	Paper 2
•Externally assessed •Availability – January and June 33⅓ % of the total International GCSE	•Externally assessed •Availability – January and June 66⅔ % of the total International GCSE

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Paper 1

Content	Assessment
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).	This paper: • Is assessed through a 1-hour 30 minute examination set and marked by Pearson. •Is weighted at 33⅓ % 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.

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Paper 2

Content	Assessment
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).	This paper: • Is assessed through a 2-hour 30 minute examination set and marked by Pearson. •Is weighted at 66⅔ % 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.

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Mark allocation of grades

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

Question types

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 (in Paper 2 only)

Problem solving and reasoning questions

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1. Short response questions

SAMs: 4MA1 Foundation Paper 1 Question 2

2 (a) Write 64% as a fraction.

Give your fraction in its simplest form.

.....

(2)

(b) Write 9% as a decimal.

.....

(1)

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

..... kg

(1)

(Total for Question 2 is 4 marks)

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

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

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

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SAMs: 4MA1 Foundation Paper 1
Question 22

22

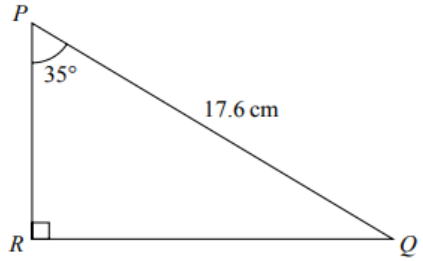

Diagram **NOT** accurately drawn

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)

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SAMS: 4MB1 Paper 1 Question 3

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

$x =$ .....

(Total for Question 3 is 2 marks)

There are two 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.

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2. 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'. This 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'.

(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)

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SAMs 4MB1 Paper 2 Question 10

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.

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 **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 **M**.

(2)

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

(3)

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

Part (e) is Grade 9

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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 candidates may be asked.

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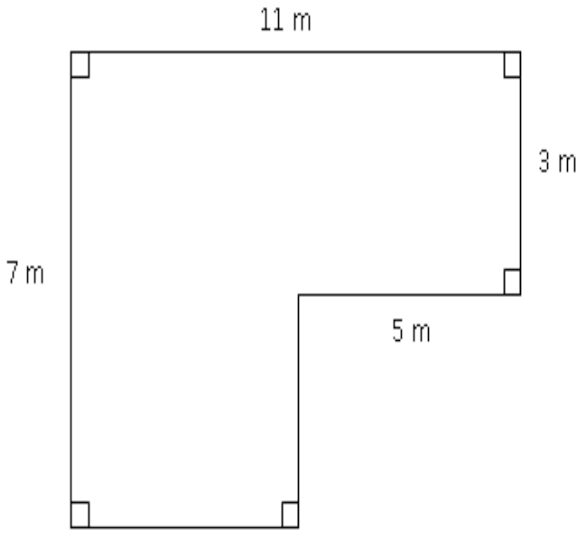
A ‘real-world’ problem

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 m² 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.

Which parts from the content (specification parts) are being addressed in this question?
What steps does a candidate need to take to solve this problem?
Think about how would you teach your students to tackle this type of question?

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

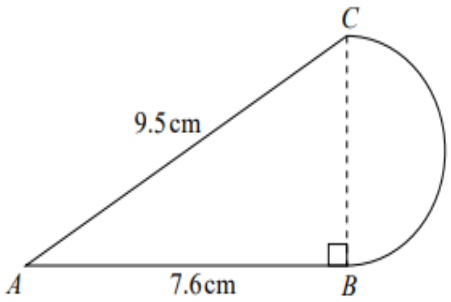

Diagram **NOT** accurately drawn

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

$AB = 7.6$ cm and $AC = 9.5$ cm.

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

A 'mathematical' problem

Which parts from the content (specification parts) are being addressed in this question?
What do you think makes this a problem solving question?

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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.

Solution **(4)**

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.

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4MA1 Foundation tier SAMs Paper 1 Question 9

ABC is an isosceles triangle.

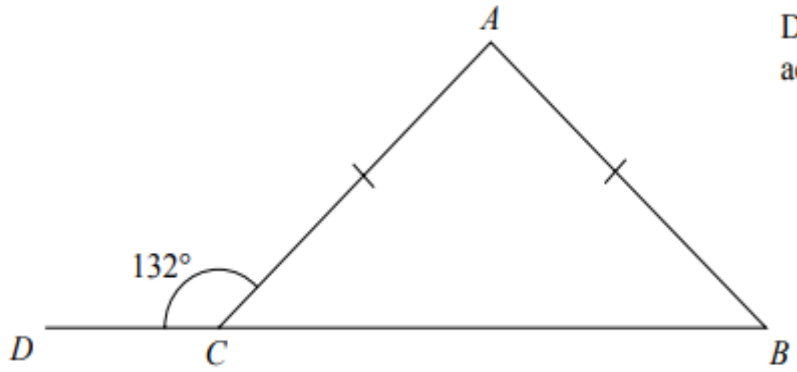

Diagram **NOT** accurately drawn

DCB is a straight line.
AC = *AB*.
Angle *DCA* = 132°

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° –132° = 48° (This is a calculation)
Angles on a straight line sum to 180° (This is the reason)

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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 $2x^3 - 3x^2 - 17x - 12$

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Break

Mark schemes

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.

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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.

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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.

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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 $2((x-2)^2-2^2+\frac{9}{2})$	$2(x-2)^2+1$	3	AO1	M1 M1 A1
	b		explanation	1	AO1	B1 E.g. Because minimum is at (2, 1)

Alternative methods

First M mark is for factorising the term in *x* squared

The second M mark is for completing the square.

The A mark is for the correct answer in the required form only.

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.

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General marking guidance

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)

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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 questions for each grade.
- The following two slides show a question and its mark scheme.

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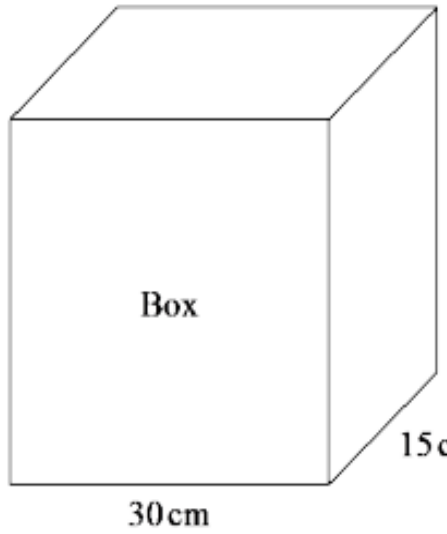
Paper 1F June 2019 Question 11



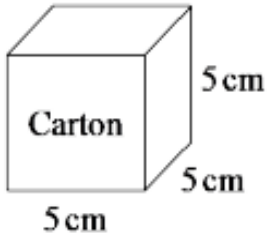


Diagram **NOT** accurately drawn

Clue?

This is a problem solving question.

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.

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Paper 1F June 2018 Question 11 mark scheme

Total marks

11	32 ÷ 5 (= 6.4 or 6) **or** 15 ÷ 5 (=3) **or** 30 ÷ 5 (=6) "6" × "3" × "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) **OR** 'yes' and 14400 and 13750

This is the column showing the required working

The answer column

The allocation of marks and additional guidance

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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.

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

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

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The exam paper

Please check the examination details below before entering your candidate information

Candidate surname	Other names

Pearson Edexcel International GCSE

Centre Number | Candidate Number

Tuesday 21 May 2019

Morning (Time: 2 hours)	Paper Reference **4MA1/1F**

Mathematics A
Level 1/2
Paper 1F
Foundation Tier

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

Total Marks

Instructions

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

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 qu*

Advice

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

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

Note this very important bullet point.

Note there are 100 marks to be answered in 120 minutes. This equates to about one minute per mark. Some questions will be answered faster than others. Encourage your students to THINK about questions which may be perplexing at first sight. There is time!

Note this very important bullet point.

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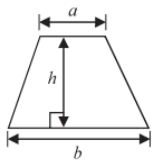
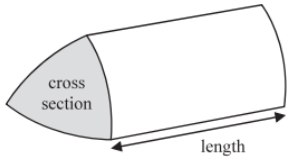
Formulae 4MA1

Formulae sheet – Foundation Tier

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

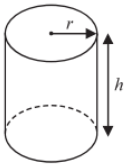


Volume of prism = area of cross section × length



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

Curved surface area of cylinder $= 2\pi rh$



International GCSE Mathematics

Formulae sheet – Higher Tier

Arithmetic series

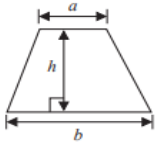
Sum to n terms, $S_n = \frac{n}{2}[2a + (n-1)d]$

The quadratic equation

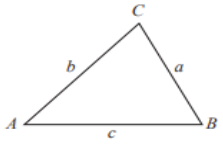
The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$ are given by:

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

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



Trigonometry



In any triangle *ABC*

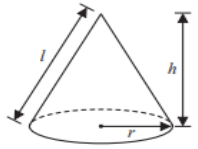
Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

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

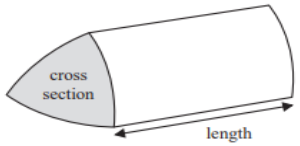
Area of triangle $= \frac{1}{2}ab\sin C$

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

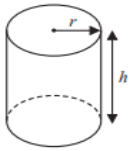
Curved surface area of cone $= \pi rl$



Volume of prism
= area of cross section × length

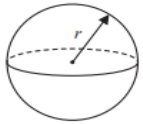


Volume of cylinder $= \pi r^2 h$
Curved surface area of cylinder $= 2\pi rh$



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

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



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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.

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

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Marking activities

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.

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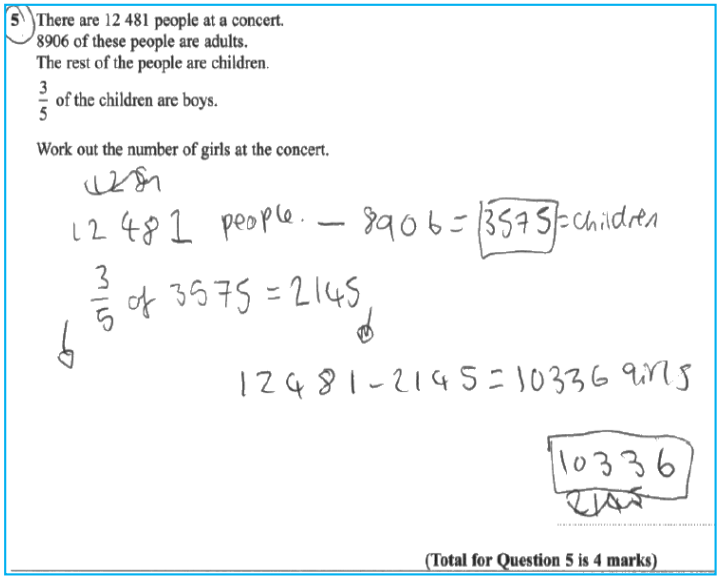
The marks were awarded as follows:

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.

12481 people − 8906 = 3575 children

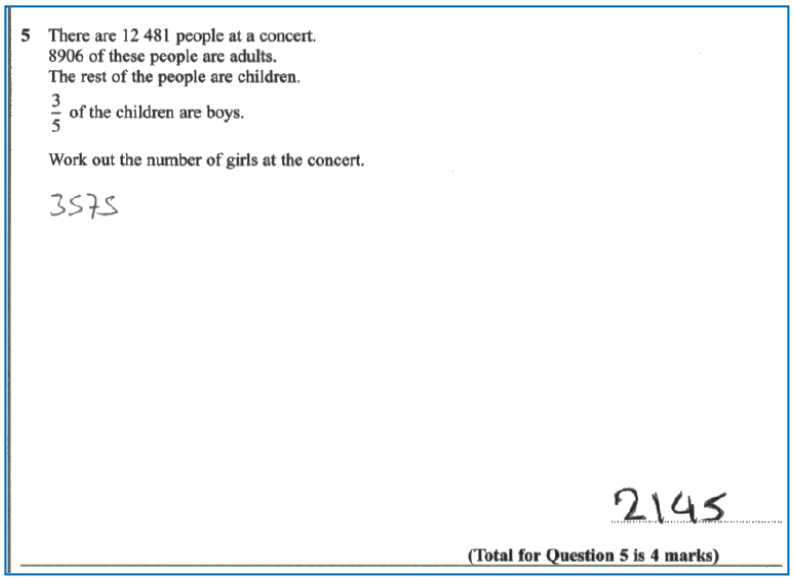
$\frac{3}{5}$ of 3575 = 2145

12481 − 2145 = 10336 girls

10336

(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.

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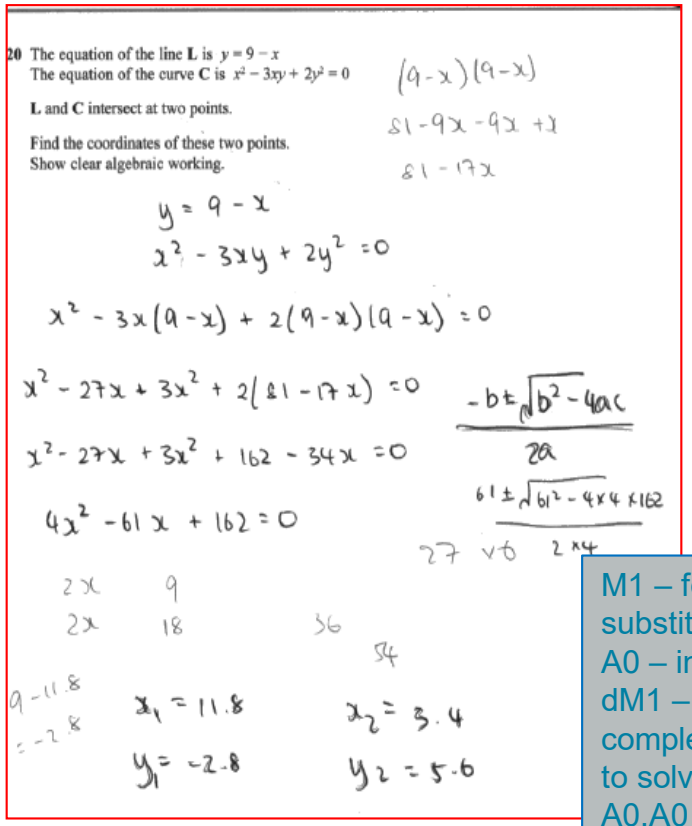
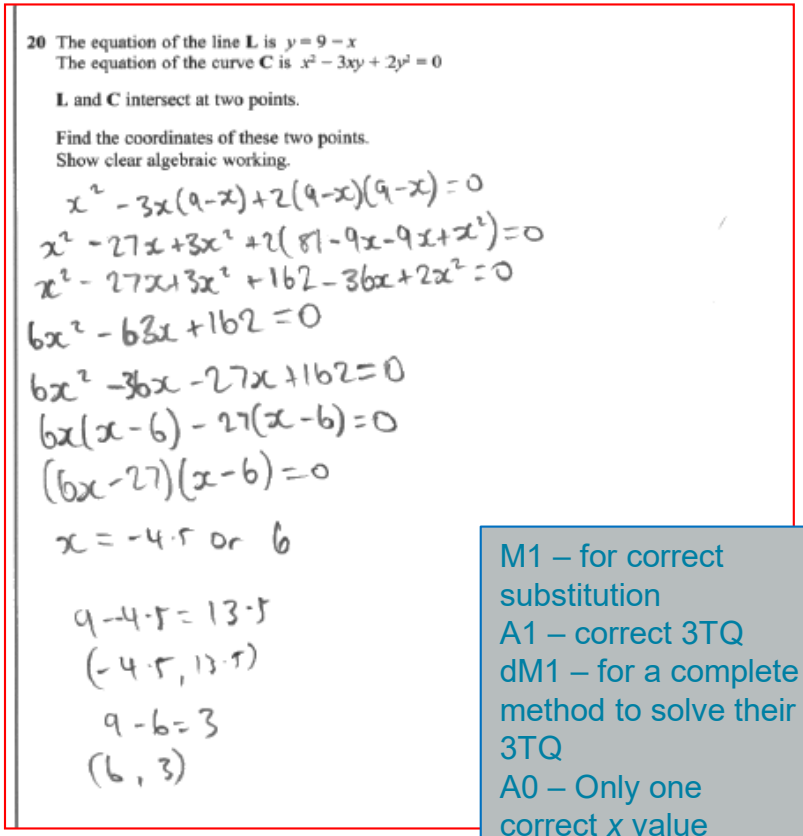
The marks were awarded as follows:

Question 20 Paper 2H



M1 – for correct substitution
A0 – incorrect 3TQ
dM1 – for a complete method to solve their 3TQ
A0,A0 Incorrect values.



M1 – for correct substitution
A1 – correct 3TQ
dM1 – for a complete method to solve their 3TQ
A0 – Only one correct *x* value
A0 – only one pair of correct coordinates.

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Marking activity (2)

Question 9 June 2019 4MB1 Paper 2

9

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

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)

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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.
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?

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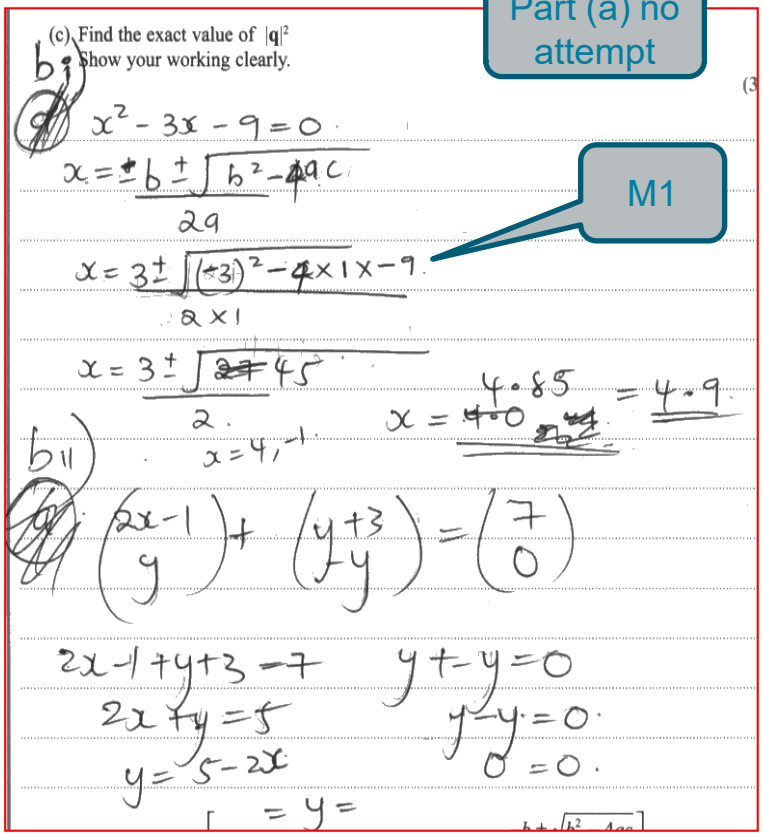
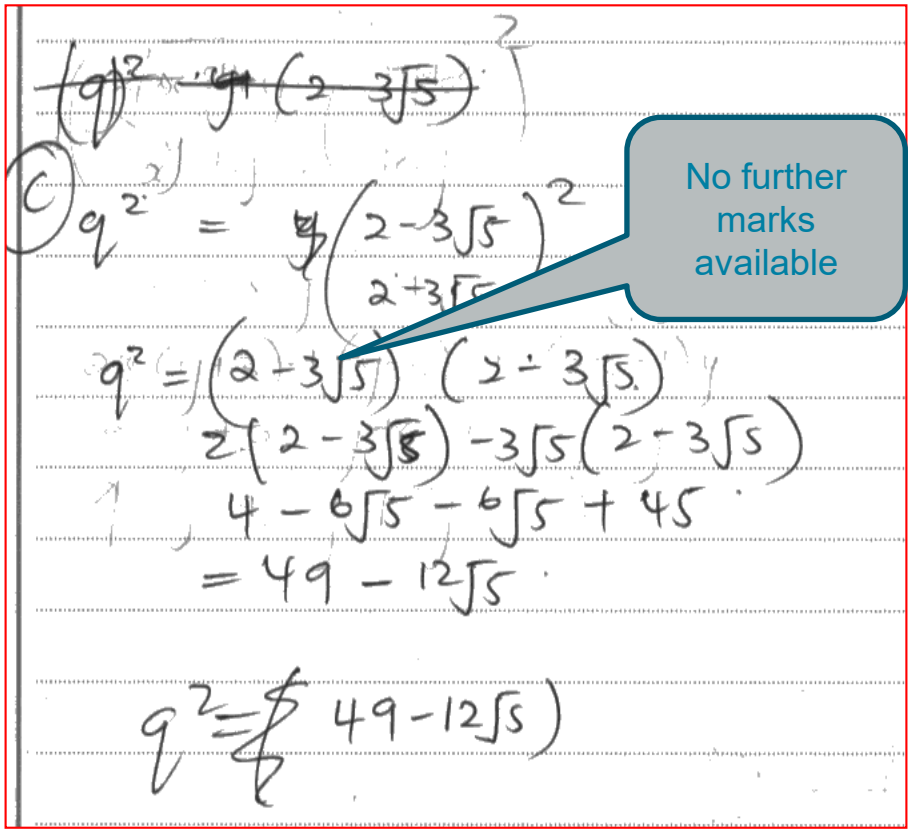
Response 1





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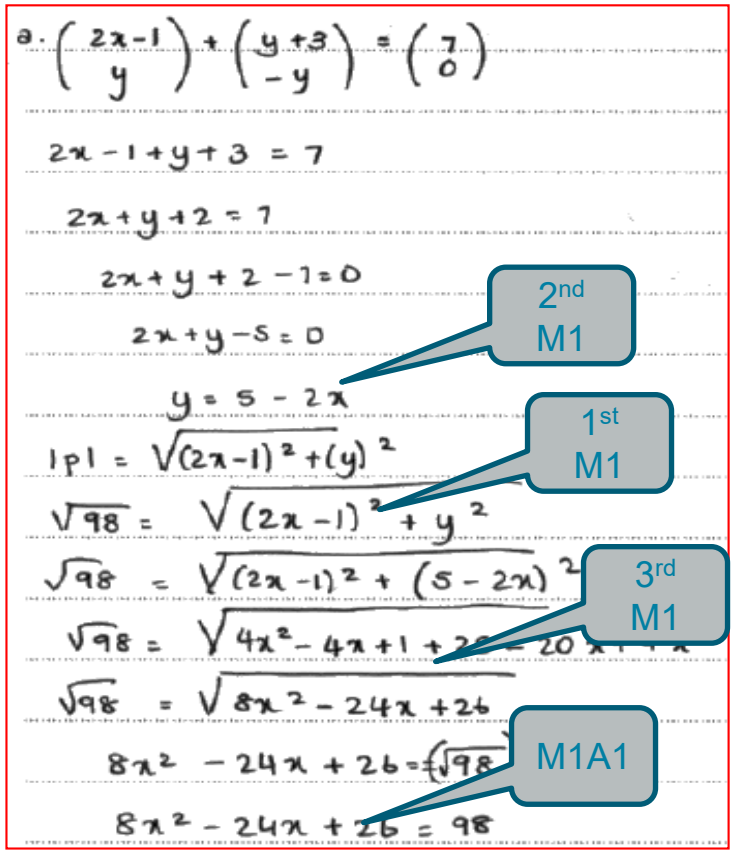
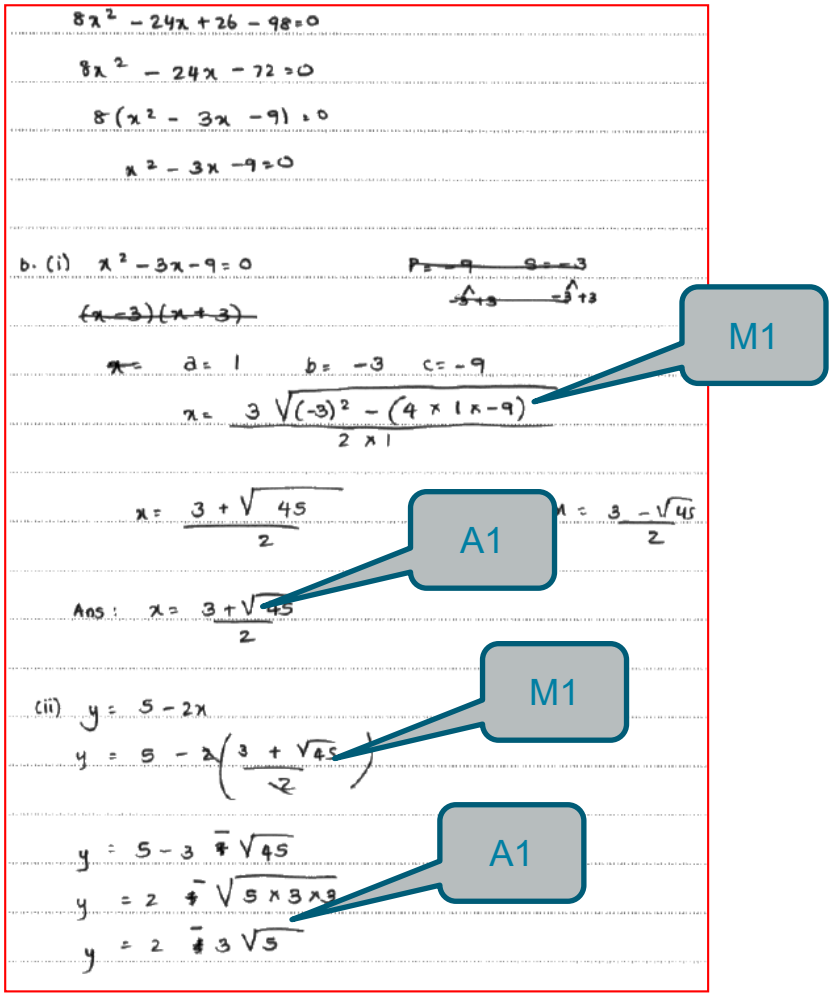
Response 2





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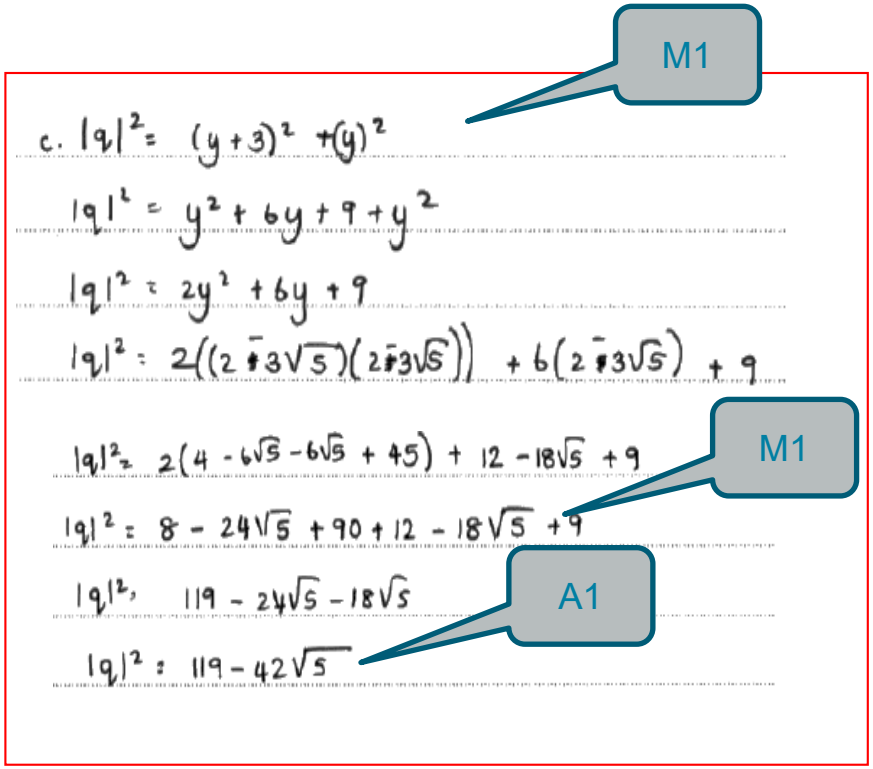
Response 2 (cont'd)



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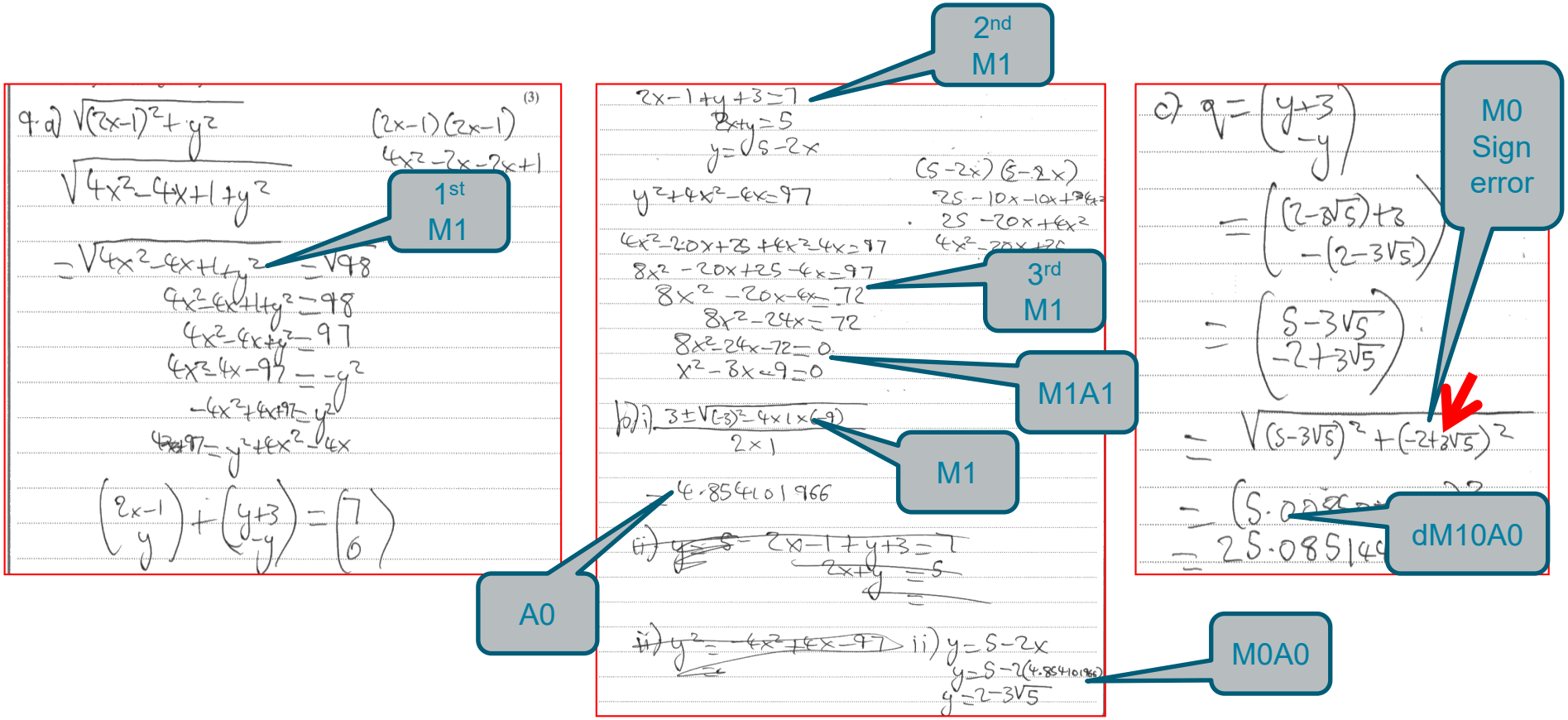
Response 3



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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

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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.

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Please fill in your evaluation forms.

We value your feedback!

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ALWAYS LEARNING