# Marking Guidance FAQs for Pearson Edexcel AS/A level Mathematics

## Contents

# General marking guidance questions

## Is there general marking guidance for all of the papers?

The general marking guidance is included at the start of the mark schemes for each exam series. View the general marking guidance (pdf) that is included on all of the AS/A level Mathematics mark schemes.

## What do each of the mark types mean?

For A level Mathematics, only M, A and B marks are used.

M marks: Method marks are awarded for 'knowing a method and attempting to apply it', unless otherwise indicated. dM or DM marks may also be seen, these are dependent method marks; what these are dependent on will be indicated in the mark scheme notes.

A marks: Accuracy marks can only be awarded if the relevant method (M) marks have been earned

B marks: Unconditional accuracy marks (independent of M marks)

## How much working out do students need to show?

For A level Mathematics, the front of the paper states "You should show sufficient working to make your methods clear. Answers without working may not gain full credit."

In general, if the question is worth only 1 or 2 marks, then, sometimes, a correct answer would imply the method marks. Reference to this may be seen in the mark scheme notes stating where this happens. If the question is longer, then examiners would always need to see sufficient working to reveal the method used to award marks, as stated on the front of the examination paper.

In the case where the question states a requirement for method to be shown or is a 'show that'/ 'prove' question, then all steps in the working need to be seen for marks to be awarded.

## Must candidates label their working (e.g. part a), b), etc.)?

In all mathematics papers, candidates should clearly indicate which part of the question they are answering, this is vital for good communication between the candidate and examiner.

This is particularly true in mechanics questions however, since the scenario often changes between parts of the question, therefore it is important that candidates make clear which part of the question they are answering.

The mark scheme guidance for most mechanics papers states that:

"In all cases, if the candidate clearly labels their working under a particular part of the question, i.e, (a) or (b) or (c)...then that working can only score marks for that part of the question."

This is a general rule for the papers, but it will be within the discretion of the Principal Examiner as to when it might not apply.

In certain circumstances, we might mark a question 'as a whole', or mark a few sections together, and if we see correct working/answers appearing, then we award the marks irrespective of how it is labelled.

## What if a candidate uses a method that is not on the mark scheme? E.g. uses a Further Maths method to solve a question in A Level Maths.

The guidance to examiners is to award credit for any valid mathematical method, unless the question specifies that a certain method must be used.

The solution methods detailed in the mark schemes are simply those that are identified as being the most frequently seen by students sitting the exam, so they are not an exhaustive list. If no specific method has been demanded, a student that uses a method that is not detailed in the mark scheme would usually receive full credit for any valid method, clearly shown, that leads to a correct solution.

# Calculator specific questions

## What calculator model do candidates need for A Level Mathematics?

Appendix 3 of the 9MA0 specification outlines the requirements for calculators at A Level. View 9MA0 Specification Appendix 3.

A scientific calculator that has the relevant statistics function will be sufficient to meet the needs of the course. A graphical calculator is not necessary, although some students do prefer the advanced functionality and find it useful to be able to graph a given function.

Any model of calculator must comply with JCQ regulations. View the JCQ Calculator Guidance.

## How do candidates know when they can use the equation solver function on their calculators and when they need to show a full algebraic method?

Calculators may always be used to check answers. Students should write down any equations that they are solving, so these can be checked and credit given.

Some questions include the one of the following statements at the start of the question in bold:

> Solutions relying entirely on calculator technology are not acceptable.
> or
> Solutions relying on calculator technology are not acceptable.

These statements restrict the use of calculators for specific questions. We have produced some guidance explaining these in more detail and outlining the difference between these statements; you can find this here.

Other phrases are also used to indicate that the use of a calculator is not permitted, these include:

- Solutions based entirely on graphical or numerical methods are not acceptable.
- Numerical (calculator) integration/differentiation is not accepted in this question.
- Use algebraic integration/differentiation to …
- Use algebra to …
- Show that …
- Prove that …

## How much working is required for solving quadratic equations and simultaneous equations?

The Enhanced Content Guidance provides guidance in the section concerning quadratic equations (section 2.3 of the Pure Maths content) as follows:

Questions will be phrased in such a way to make it clear if calculators should not be used, for example '... using algebra ...' or '... showing each stage of your working ...', solve the equation $x^2 - 6x + 4 = 0$'.

Where a question requires candidates to solve an equation algebraically without the use of a calculator, the general marking guidance at the start of the mark scheme provides specific guidance on the working needed to award a method mark for solving a 3-term quadratic:

> **Method mark for solving 3 term quadratic:**
>
> **1. Factorisation**
>
> $(x^2 + bx + c) = (x + p)(x + q)$, where $|pq| = |c|$, leading to $x = \cdots$
>
> $(ax^2 + bx + c) = (mx + p)(nx + q)$, where $|pq| = |c|$ and $|mn| = |a|$, leading to $x = \cdots$
>
> **2. Formula**
>
> Attempt to use the correct formula (with values for $a$, $b$ and $c$)
>
> **3. Completing the square**
>
> Solving $(x^2 + bx + c) = 0$: $\left(x \pm \frac{b}{2}\right)^2 \pm q \pm c = 0,\ q \neq 0$, leading to $x = \cdots$

For simultaneous equations, candidate would need to show sufficient working to indicate they have not used their calculator.

So, unless there is wording that indicates that calculators should not be used, candidates can use calculators, however candidates should always write down any equations that they are solving (since it is often forming these equations that attract at least some of the marks).

# Content specific questions

## Pure Mathematics

### What are the requirements for set notation?

Appendix 2 to the specification provides detailed guidance of the set notation that candidates are expected to know and be able to use. View 9MA0 Specification Appendix 2.

Listed below are some specific cases which are acceptable:

- Union and intersection are permitted if used within a set. E.g. $\{k: k < 0 \cup k > 8\}$ is permitted
- You do not need to mention the reals, e.g. $\left\{x: x < \frac{5k}{3}\right\} \cap \{x: x > k\}$ is fine
- Both colons and vertical lines are permitted, e.g. in the above two examples a vertical line would be fine

### Is the "DI" or tabular method for integration by parts allowed?

The direct integration (DI) method, if used very carefully is an acceptable method for integration by parts under our mark schemes. A student applying the DI method with no errors to find the correct integral would be awarded full credit.

Method and accuracy marks would be awarded on the same underlying principles as for the 'traditional' method. The notes to the mark scheme give appropriate guidance for awarding each mark.

## Statistics

### What are the rules about using a calculator in Statistics?

Students will need to be able to find probabilities for a binomial distribution using their calculators.

Students are expected to use a calculator to find probabilities for a Normal distribution.

When finding a critical region or using an inverse Normal, we cannot assume that all students will be able to do this using a calculator and so tables of values are provided. However, if students do have the facility to do this on their calculator, then that is an acceptable method.

The front of the paper states that " Values from statistical tables should be quoted in full. If a calculator is used instead of tables the value should be given to an equivalent degree of accuracy."

## Mechanics

### What value of *g* should students use in the mechanics paper?

The front page of the exam paper includes an explicit instruction to students as follows:

> *Unless otherwise indicated, whenever a value of g is required, take g = 9.8ms$^{-2}$ and give your answer to either 2 significant figures or 3 significant figures.*

The Examiner's Report for the June 2023 series also commented on this specific issue as follows:

> *In calculations the numerical value of g which should be used is 9.8. Final answers should then be given to 2 (or 3) significant figures – more accurate answers will be penalised, including fractions but exact multiples of g are usually accepted.*

### Can I use column vectors in mechanics questions?

If **i**, **j** (and **k**) have been defined in the question, column vectors are accepted in the working and in final answers, unless the question specifically asks for the answer to be given in terms of **i**, **j** (and **k**).

### How are equations marked in mechanics?

The mark scheme guidance states the following rules for awarding M marks:

- M marks require that there are the correct no. of terms; dimensionally correct; all terms that need resolving (i.e. multiplied by cos or sin) are resolved.
- The omission of, or inclusion of an additional, *g* in a resolution is an accuracy error not method error.
- The omission of mass from a resolution is a method error.
- The omission of a length from a moments equation is a method error.
- The omission of units, or incorrect units, is not (usually) counted as an accuracy error.

# Formulae Booklet

## Where can I find the Formulae Booklet?

The Mathematical formulae and statistical Tables booklet for AS/A Level Mathematics (8MA0/9MA0), AS/A Level Further Mathematics (8FM0/9FM0) and the Advanced Extension Award in Mathematics (9811) can be found on the Pearson website. View and download the Mathematical formulae and statistical tables (PDF).

## How can I order more Formulae Booklets for the exams?

Centres entering candidates for the first time will be provided with sufficient printed copies of the formulae booklet within their delivery of question papers. For subsequent sittings, centres may print their own formulae booklets from the website (view and download the Mathematical formulae and statistical tables (PDF)) or order more printed copies to be delivered. The support article explains how to place an order. Access the support article for placing an order on the exam/centre stationery website.

# Further support & guidance

## Where can I find more information about marking guidance?

You can watch a recording from our most recent Marking Guidance training event. We also run live versions of these sessions once a year in the Autumn term, so keep an eye out for these on the PD Academy. Visit the PD Academy to view upcoming events.

## My question hasn't been answered, who can I ask for extra guidance?

If you have a question relating to teaching AS/A level Mathematics please contact teachingmaths@pearson.com.

Also, make sure you sign up to the monthly Subject Advisor updates, to keep up to date on our latest support and resource releases throughout the year.