Course report 2025

Higher Mathematics

This report provides information on candidates' performance. Teachers, lecturers and assessors may find it useful when preparing candidates for future assessment. The report is intended to be constructive and informative, and to promote better understanding. You should read the report with the published assessment documents and marking instructions.

We compiled the statistics in this report before we completed the 2025 appeals process.

Grade boundary and statistical information

Statistical information: update on courses

Number of resulted entries in 2024: 18,517

Number of resulted entries in 2025: ` 19,767

Statistical information: performance of candidates

Distribution of course awards including minimum mark to achieve each grade

Course award	Number of candidates	Percentage	Cumulative percentage	Minimum mark required
A	8,144	41.2	41.2	86
B	3,597	18.2	59.4	73
C	2,862	14.5	73.9	60
D	2,059	10.4	84.3	47
No award	3,105	15.7	100%	Not applicable

We have not applied rounding to these statistics.

You can read the general commentary on grade boundaries in the appendix.

In this report:

- ‘most’ means greater than or equal to 70%
- ‘many’ means 50% to 69%
- ‘some’ means 25% to 49%
- ‘a few’ means less than 25%

You can find statistical reports on the statistics and information page of our website.

Section 1: comments on the assessment

The course assessment performed largely as expected and proved accessible to most candidates. Feedback from the marking team and teachers and lecturers indicated it was positively received by centres and was fair and accessible.

Candidates had good opportunities to demonstrate their knowledge and understanding of the course.

Question paper 1 (non-calculator)

The level of demand for question 10 was lower than expected. We took this into account when setting the grade boundaries.

Question paper 2

The level of demand for question 9(a) was lower than expected. We took this into account when setting the grade boundaries.

Section 2: comments on candidate performance

Most candidates attempted most questions. Many candidates set out their working well and gave solutions in a clear and concise manner.

Some candidates' solutions were not well-structured. The handwriting and layout of their solutions led to working that was difficult for markers to read and interpret. Some candidates appeared to make transcription errors with '3' and '5', '4' and 'y', and '1' and '7' and missed out on marks as a result.

Question paper 1 (non-calculator)

Most candidates made a good attempt at all questions. Many candidates missed out on marks due to numerical inaccuracies in their responses.

Question 1: determining the equation of a tangent

Most candidates attempted this question well.

A few candidates inappropriately labelled lines of working with '$y = \ldots$' rather than '$\frac{dy}{dx} = \ldots$'.

Question 2: determining the equation of a perpendicular bisector

Most candidates attempted this question well.

Question 3: finding an indefinite integral

Most candidates attempted this question well. Some candidates did not include the constant of integration at the appropriate point in their solution.

Question 4: simplifying a numerical logarithmic expression

Most candidates attempted this question well. Many candidates did not evaluate the final logarithmic expression correctly.

Question 5: transforming the graph of a function

Many candidates did not gain full marks for this question. Common issues included not considering the shape of the transformed graph, only applying a single transformation, and applying a reflection in the x-axis.

Question 6: using the double-angle formula and the addition formula

Many candidates attempted this question well.

Some candidates did not apply the formulae from the formulae list.

A few candidates incorrectly stated that $\sin 2q = 2\sin q$ and $\sin(2q - r) = 2\sin q - \sin r$.

Some candidates incorrectly stated that $\sqrt{26} \times \sqrt{26} = \sqrt{26}$.

A few candidates did not simplify their final fractional answers.

Question 7: solving a polynomial

Most candidates gained full marks for part (a). A few candidates presented the standard synthetic division algorithm in a non-standard way.

Most candidates attempted part (b) well.

A few candidates did not write consistent lines of working. Responses that included the following lines of working were common:

$$\begin{aligned} &5x^2+x-4 \\ &=x^2+x-20 \\ &=(x+5)(x-4) \\ &=(x+1)(5x-4) \end{aligned}$$

$$\begin{aligned} &5x^2+x-4 \\ &=5x^2-4x+5x-4 \\ &=x(5x-4)\ 1(5x-4) \\ &=(x+1)(5x-4) \end{aligned}$$

The inconsistencies meant that these examples did not gain full marks despite reaching the ‘correct’ factorised form.

Question 8: solving a logarithmic equation

Many candidates attempted this question well. Some candidates did not convert from logarithmic form to exponential form.

Question 9: finding the point of intersection of a line and a circle

Most candidates attempted this question well. A few candidates stated the centre and radius of the circle with no other working.

Some candidates did not expand brackets or simplify the equations accurately. Many candidates did not extract a common factor, which made factorisation more complex than required.

Question 10: using the angle between two vectors

Many candidates attempted this question, which was intended to be more challenging.

Many candidates incorrectly stated that $\sqrt{10+k^2} = \sqrt{10}+k$ or $\sqrt{10+k^2} = \sqrt{10\times k^2}$ or $\sqrt{10+k^2} = \sqrt{10}+k^2$.

A few candidates stated $\begin{pmatrix}1\\1\\0\end{pmatrix} \cdot \begin{pmatrix}1\\3\\k\end{pmatrix} = \begin{pmatrix}1\\3\\0\end{pmatrix} = 4$, which did not gain full marks.

A few candidates incorrectly stated that $0\times k = k$.

Question 11: using the discriminant

Most candidates used the correct strategy in this question.

Some candidates used an incorrect condition or did not state the inequality that they were solving.

A few candidates missed out on marks because they did not use brackets when substituting into $b^2 - 4ac$.

A few candidates incorrectly used a single inequality to represent two regions in their final answer, for example $0 > k > 4$.

Question 12: solving a differential equation

Many candidates attempted this question well.

Some candidates did not include a constant of integration, which led to invalid working.

Question 13: determining stationary points and sketching a cubic function

Some candidates expanded and then re-factorised the expression given for $f'(x)$. A few candidates made errors when factorising, particularly when dealing with negative signs.

This question was intended to be more demanding. Only a few candidates drew a cubic function and most candidates did not interpret the conditions stated in the question.

Some candidates treated the question as a differential equation.

Question paper 2

Most candidates made a good attempt at all questions.

Question 1: working with lines within triangles

Most candidates attempted this question well.

A few candidates stated $m = -\frac{1}{3} = 3$ when determining a perpendicular gradient, which did not gain full marks.

A few candidates scored out terms in the simultaneous equations, which led to inconsistent lines of working.

Many candidates used the inefficient method of elimination rather than substitution, which led to errors.

Question 2: completing the square

Most candidates attempted this question well.

Some candidates did not deal with the numeric terms accurately, which led to inconsistent lines of working.

Question 3: evaluating the area under a curve

Many candidates attempted this question well. Some candidates did not include 'dx' in the statement of the definite integral. A few candidates switched the limits and did not deal with their negative result appropriately or made an error removing the need to deal with a negative result. Those responses did not gain full marks.

Many candidates included additional lines of working instead of using their calculator efficiently.

Question 4: finding an inverse function

Many candidates attempted this question well.

A few candidates stated multiple expressions for '$y = \ldots$' or '$g^{-1}(x) = \ldots$', which did not gain full marks.

A few candidates did not work with the cube root accurately.

Question 5: using collinearity

Few candidates communicated their conclusions unambiguously.

A few candidates wrote statements, such as $\overrightarrow{AB} = \begin{pmatrix} 9 \\ -3 \\ 6 \end{pmatrix} \div 3 = \begin{pmatrix} 3 \\ -1 \\ 2 \end{pmatrix}$, which did not gain full marks.

A few candidates attempted to find a 'gradient of a vector'.

Many candidates' conclusions incorrectly implied that the points were parallel or that the lines were collinear.

Question 6: working with the wave function

Most candidates attempted part (a) of this question well.

Many candidates made processing errors during at least one stage of their working.

Some candidates worked in degrees throughout, and a few candidates mixed degrees and radians in single lines of working.

Only a few candidates dealt with the phase change accurately in part (b).

Question 7: finding an indefinite integral

Many candidates attempted this question well.

Some candidates did not include the constant of integration or deal with the coefficient of x accurately.

Question 8: determining a vector pathway

Many candidates did not gain any marks for this question.

Some candidates stated incorrect pathways, and some candidates did not add vectors presented in terms of $\mathbf{i}$, $\mathbf{j}$ and $\mathbf{k}$.

Question 9: working with a recurrence relation

Many candidates attempted this question well.

A few candidates did not make reference to m and some candidates made numerical processing errors.

Question 10: solving an optimisation problem

Some candidates did not attempt part (a) of this question, but most candidates made a reasonable attempt at part (b).

Some candidates did not deal with the negative indices accurately.

Some candidates did not have solutions that met the minimum requirements for a nature table. Common errors included numerical errors when evaluating the derived function in a neighbourhood of the minimum and incorrect labelling within the nature table.

Question 11: solving a trigonometric equation

Many candidates did not extract a common factor of $\cos x$ from the trigonometric equation.

A few candidates divided the equation by $\cos x$, which led to missing solutions.

Question 12(a): working with composite functions

Most candidates achieved full marks for part (a) of this question.

Question 12(b): using the chain rule

Most candidates did not differentiate '$+3$' correctly or did not apply the chain rule correctly.

A few candidates attempted to expand their answer from part (a), which led to errors.

Question 13: using an exponential equation

Most candidates achieved full marks for part (a). A few candidates wrote several lines of working instead of simply stating the answer or using their calculator.

Many candidates wrote inconsistent lines of working for part (b) and made errors converting the equation from exponential form to logarithmic form.

Question 14: working with the equations of circles

Most candidates achieved full marks for parts (a) and (b).

Part (c) of this question was intended to be more demanding. Only a few candidates successfully determined the equation of the third circle and included working that communicated their approach sufficiently. These candidates used a range of approaches to find the centre and radius of the third circle, including geometry, algebra, similarity, stepping out, gradient, ratios, and vectors.

Section 3: preparing candidates for future assessment

The comments in the previous sections and those below can help teachers and lecturers to prepare future candidates for the Higher Mathematics question papers.

- Maintain and practise basic numerical skills regularly, particularly fractions and negative numbers.
- Encourage candidates to check their final answers carefully and to simplify final answers, where possible.
- Encourage candidates to lay out their working in a structured and logical manner. Each line of working should follow logically from the line above. This is particularly important when differentiating and integrating, and when working with logarithms and exponentials.
- Encourage candidates to use notation and symbols accurately throughout the course, for example integral notation.
- Encourage candidates to use brackets appropriately throughout the course, particularly when calculating definite integrals and when substituting negative numbers into formulae.
- When teaching algorithms that arrive at the correct final answer, emphasise the intervening steps. Candidates should understand that when factorising a quadratic expression, statements that are inconsistent from line to line do not gain full marks.
- Consider how best to practise using radian measure and the exact values of trigonometric ratios.
- Consider how best to practise determining vector pathways in three dimensions.
- Encourage candidates to use a calculator, and efficiently record their working, when preparing for paper 2.
- Encourage candidates to score out working that does not form part of their final response, including working in the ‘additional space for answers’ section at the back of the answer booklet.
- Consider how best to practise sketching graphs of functions on provided axes.

- Consider how best to encourage candidates to complete nature tables when determining the nature of stationary points, and when confirming maximum or minimum values.
- Provide opportunities for candidates to attempt more challenging and novel questions under exam conditions.

Teachers and lecturers delivering the Higher Mathematics course, and candidates taking the course, can consult the detailed marking instructions for the 2025 course assessment on our website. These illustrate the requirements for questions on, for example, use of the discriminant, solving differential equations, sketching graphs, finding the inverse, working with collinearity, calculating the area under a curve, using the wave function, and determining the nature of stationary points or confirming maximum or minimum values. Our website also contains the marking instructions from previous years.

The Understanding Standards website contains examples of candidate evidence with commentary.

Appendix: general commentary on grade boundaries

Our main aim when setting grade boundaries is to be fair to candidates across all subjects and levels and to maintain comparable standards across the years, even as arrangements evolve and change.

For most National Courses, we aim to set examinations and other external assessments and create marking instructions that allow:

- a competent candidate to score a minimum of 50% of the available marks (the notional grade C boundary)
- a well-prepared, very competent candidate to score at least 70% of the available marks (the notional grade A boundary)

It is very challenging to get the standard on target every year, in every subject, at every level. Therefore, we hold a grade boundary meeting for each course to bring together all the information available (statistical and qualitative) and to make final decisions on grade boundaries based on this information. Members of our Executive Management Team normally chair these meetings.

Principal assessors utilise their subject expertise to evaluate the performance of the assessment and propose suitable grade boundaries based on the full range of evidence. We can adjust the grade boundaries as a result of the discussion at these meetings. This allows the pass rate to be unaffected in circumstances where there is evidence that the question paper or other assessment has been more, or less, difficult than usual.

- The grade boundaries can be adjusted downwards if there is evidence that the question paper or other assessment has been more difficult than usual.
- The grade boundaries can be adjusted upwards if there is evidence that the question paper or other assessment has been less difficult than usual.
- Where levels of difficulty are comparable to previous years, similar grade boundaries are maintained.

Every year, we evaluate the performance of our assessments in a fair way, while ensuring standards are maintained so that our qualifications remain credible. To do this, we measure evidence of candidates' knowledge and skills against the national standard.

For full details of the approach, please refer to the Awarding and Grading for National Courses Policy.