Course report 2025

Advanced 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: 4,390

Number of resulted entries in 2025: 4,469

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	1,845	41.3	41.3	83
B	811	18.1	59.4	71
C	579	13.0	72.4	60
D	477	10.7	83.1	48
No award	757	16.9	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

Question paper 1 (non-calculator)

Feedback indicated that paper 1 was less demanding than expected, particularly question 8. We took this into account when setting the grade boundaries.

Question paper 2

Feedback indicated that paper 2 was less demanding than expected, particularly questions 5, 11 and 13. We took this into account when setting the grade boundaries.

Section 2: comments on candidate performance

Many candidates demonstrated their knowledge and understanding of established techniques and routines to answer questions 1, 2, and 4 in paper 1 and questions 1, 2, 3, 4, and 5 in paper 2.

Some candidates produced excellent and insightful answers for the more challenging questions, in particular question 8(c) in paper 1, and questions 16, 17, and 18(a) parts (i) and (ii) in paper 2.

Some candidates did not simplify final answers, particularly in questions 6(b) and 7(b) in paper 2. Some candidates' responses to questions 9(b), 13(a)(ii), and 15 in paper 2 lacked clear communication.

Question paper 1 (non-calculator)

Question 1

A few candidates produced the general term rather than the full binomial expansion.

Question 3

Some candidates did not attempt to multiply the numerator and denominator of a complex fraction by the complex conjugate of the denominator.

Question 4(b)

A few candidates did not give the correct transpose of a matrix.

Question 6(b)

After successfully writing a rational function in the required form, some candidates did not state the equation of the non-vertical asymptote.

Question 7

Although many candidates correctly handled the integration leading to a logarithmic expression with a unitary coefficient, many candidates did not state the correct coefficient in the other case.

Question 8(a)

Most candidates successfully used Gaussian elimination to find the point of intersection of the three planes.

Question 8(b)

Many candidates wrote the equations of a line in parametric form and substituted these into a plane equation to find the point of intersection.

Question paper 2

Question 5

Many candidates applied logarithmic differentiation, handled the resultant product, and rearranged to produce the required result.

Question 6(a)

Some candidates did not produce the Maclaurin expansion of a simple trigonometric function.

Question 6(b)

Many candidates did not square their answer to part (a). Some of these candidates attempted to begin again from first principles.

Question 7

Particularly in part (b), a few candidates wrote expressions containing two variables, rather than just the parameter.

Question 8(b)

Most candidates did not take an appropriate first step to find an expression for the inverse.

Question 10

Most candidates wrote down two correct expressions, possibly with the help of the formula list. Although these expressions already contained two common factors, many candidates multiplied out both expressions, greatly increasing the difficulty of the required factorisation. Only a few candidates produced a complete factorisation.

Question 11(a)

Most candidates used substitution to rewrite an integral in terms of a new variable, but only some candidates correctly processed the resulting simple integral.

Question 11(b)

Most candidates gave the correct form of integral for finding the volume of revolution. Some candidates then wrote this in integrable form, and a few candidates produced the final value. A few candidates gave an approximate final answer instead of the required exact value.

Question 13(d)

Many candidates correctly stated that a given change would have no effect on the common ratio of a geometric sequence. While many candidates stated that there would be an effect on the sum to infinity, some candidates did not accurately state what that effect would be.

Question 14

Some candidates omitted the negative sign when determining the integrating factor for a differential equation.

Question 16

In cyclic integration by parts, some candidates who noted the reappearance of the original integral stated that this meant no solution or an infinite solution.

Question 17

Some candidates coped well with a related rates of change question involving a combined increase and decrease in one of the variables. A few candidates introduced a new, non-standard variable without definition, and some candidates gave an incorrect unit or did not include a unit in their final answer.

Question 18(b)

A few candidates produced the two required solutions.

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 Advanced Higher Mathematics question papers.

- Teachers and lecturers should encourage candidates to thoroughly revise established techniques and routines to ensure their familiarity and understanding. Established routines are particularly useful when solving a differential equation using an integrating factor (for example, question 14 in paper 2) and dealing with a standard integral (for example, question 5 in paper 1).
- Candidates should practise proof by induction (for example, question 15 in paper 2), so that they are familiar with the vocabulary necessary to demonstrate their understanding of the process. They should be aware that omitting certain words or phrases can invalidate the proof. They should ensure that they clearly show details such as substitution and algebraic manipulation.
- Candidates should be able to provide the determinant of a given matrix (for example, question 4(b) in paper 1). In more abstract matrix algebra (for example, question 8 in paper 2), candidates should practise finding higher powers or the inverse of a matrix where its square is given in terms of the matrix and the identity matrix.
- Teachers and lecturers should emphasise accurate use of notation, terminology, brackets and symbols to their candidates. Candidates can miss out on marks for omitting brackets in questions, for example questions 1 and 2 in paper 1 and questions 7 and 16 in paper 2.
- Teachers and lecturers should emphasise the importance of writing numbers, symbols and letters clearly and unambiguously. Markers can find candidates' handwriting difficult to interpret, especially if a candidate has written over their original answer to make a correction. Candidates should not write over their original answer if they make a mistake. They should score through the original answer and write their new answer legibly on a blank space in their answer

booklet. Candidates should ensure their layout leaves the marker in no doubt about what they should mark and what they can ignore.

- Teachers and lecturers should remind candidates that they need to be accurate at all times when writing integrals. This is especially important when the relevant variable is not obvious, for example integration by substitution (question 11(a) in paper 2), volume of revolution (question 11(b) in paper 2), and first-order differential equations involving two variables (question 7 in paper 1).
- Teachers and lecturers should encourage candidates to develop the habit of including a constant when determining an indefinite integral and to take care with notation if the constant is subsequently manipulated, for example question 7 in paper 1 and questions 9(a) and 14 in paper 2.
- Candidates should ensure that they reinforce prior knowledge, especially basic algebra and the laws of indices. In particular, they should be aware that expressions can often be simplified by looking for common factors (for example question 10 from paper 2), rather than multiplying out expressions. Candidates should practise applying the laws of logarithms and indices (for example, question 5 in paper 2 and question 7 in paper 1).
- Teachers and lecturers should encourage candidates to look for accessible marks in the parts of the assessment they find more challenging and to persevere and work to the end of each question paper.

Teachers and lecturers delivering the Advanced Higher Mathematics course, and candidates taking the course, can consult the detailed marking instructions for the 2025 course assessment on our website. 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.