



FINAL HONOUR SCHOOL OF MATHEMATICS AND PHILOSOPHY PART A 2024

First Notice to Candidates

This Notice gives details of Mathematics and Philosophy second year examinations in Mathematics.

- The full regulations for the Part A examination are contained in the Examination Decrees and Regulations. Full particulars about the syllabus and other information can be found on the Mathematical Institute's website:
<https://www.maths.ox.ac.uk/members/students/undergraduate-courses>
- A note about examination conventions relating to the marking of papers in Part A is attached. Your marks will be reported to you in the University's standard format which consists of a mark in the range 0-100 for each paper.
- The timetable for the examination has been set by the Examination Schools and is available to you through Student Self Service. Timetabling is an extremely complicated process and once the timetable is published it cannot be changed. If you are unable to take a paper at the stipulated time for a religious or other compelling reason, you should ask your college to make the appropriate application on your behalf. Please do not ask the examiners; they do not have authority to act on such matters.
- A Second Notice will be sent out later with information about practical arrangements in the Examination Schools, including use of candidate numbers, handing in of scripts and so on.

Dr Richard Earl
Chair of Part A Examiners
Mathematical Institute
February 2024

Part A 2024 Mathematics and Philosophy: Marking of papers in Mathematics

University Standardised Marks

Examination scripts, theses, dissertations, and essays are marked by examiners and assessors. Their marks result ultimately in a University Standardised Mark (USM), in the range from 0 to 100, for each script and submitted piece of work, which are then used in the process of classifying candidates. USMs in the classification process are always whole numbers.

In classified examinations USMs on each individual script is correlated with classification bands as follows:

- 70-100: First Class
- 60-69: Upper Second Class
- 50-59: Lower Second Class
- 40-49: Third Class
- 30-39: Pass
- 0-29: Fail

Format of Examination Papers

Part A consists of two core papers A0 and A2, papers A3, A4, A5, A8 relating to the long options and paper ASO relating to the short options. Paper A2 is of 3 hours' duration with all other papers being 1.5 hours in duration.

In all papers, each question is worth 25 marks and candidates may submit answers to as many questions as they wish.

Candidates are required to offer Papers A0 and A2 and also two papers from Papers A3, A4, A5, A8, and ASO.

Paper A0: Linear Algebra

This core paper consists of three questions and the best two answers will count towards a candidate's total mark for the paper.

Paper A2: Metric Spaces and Complex Analysis

This core paper consists of six questions and the best four answers will count towards a candidate's total mark for the paper.

Papers A3, A4, A5, A8: Long Options

The long option paper[s] consist of three questions and the best two answers will count towards a candidate's total mark for the paper.

The Long Options refer to the following papers:

A3: Rings and Modules

A5: Topology

A4: Integration

A8: Probability

Paper ASO: Short Options

This paper will contain one question on each of the short options. The best two answers will count towards a candidate's total for the paper.

The questions will be numbered according to the following scheme:

- | | |
|-------------------------------------------|--------------------------------------|
| 1. Number Theory | 6. Calculus of Variations |
| 2. Group Theory | 7. Graph Theory |
| 3. Projective Geometry | 8. Special Relativity |
| 4. Multidimensional Analysis and Geometry | 9. Mathematical Modelling in Biology |
| 5. Integral Transforms | |

Calculators

The use of calculators will not be permitted in these examinations.

Marking of Papers

Questions on all papers will be marked out of 25. Mark schemes will aim to ensure that the following qualitative criteria hold:

20-25 marks: a completely or almost completely correct answer, showing excellent understanding of the concepts and skill in carrying through the arguments and/or calculations; minor slips or omissions only.

13-19 marks: a good though not complete answer, showing understanding of the concepts and competence in handling the arguments and/or calculations. In this range, an answer might consist of an excellent answer to a substantial part of the question, or a good answer to the whole question which nevertheless shows some flaws in calculation or in understanding or in both.

7-12 marks: Standard material has been substantially and correctly answered with some possible minor progress on to other parts of the question.

0-6 marks: Some progress has been made with elementary, accessible material.

This should be regarded as a guide conveying the intentions of the examiners.

Classification Conventions

At the end of the Part A Examination, a candidate will be awarded a University Standardised Mark (USM) for each of the papers offered. The Examiners may scale the raw marks to arrive at the USMs reported to candidates.

The scaling algorithm used by the mathematics examiners is explained in detail in the 2023 examiners' report which can be found at:

<https://www.maths.ox.ac.uk/members/students/undergraduate-courses/examinations-assessments/examiners-reports>

When scaling the raw marks on a paper the examiners will consider the following:

- the total sum of the marks for all questions on the paper, subject to the rules above on numbers of questions answered.
- the relative difficulty of the paper compared to the other Part A papers.
- the report submitted by the examiner or assessor who set and marked the paper.

Examiners will use their academic judgement to ensure that appropriate USMs are awarded and may use further statistics to check that the marks assigned fairly reflect the students' performances on a paper.

The USMs awarded to a candidate for the papers offered in Part A will be carried forward into a classification as described below. **Part A is not classified separately.**

Qualitative Class Descriptors

Qualitative descriptors of examination performance in Mathematics for the various classes are as follows:

First Class: the candidate shows excellent skills in reasoning, deductive logic and problem-solving. They demonstrate an excellent knowledge of the material, and can use that in unfamiliar contexts.

Upper Second Class: the candidate shows good or very good skills in reasoning, deductive logic and problem-solving. They demonstrate a good or very good knowledge of much of the material.

Lower Second Class: the candidate shows adequate basic skills in reasoning, deductive logic and problem-solving. They demonstrate a sound knowledge of much of the material.

Third Class: the candidate shows reasonable understanding of at least part of the basic material and some skills in reasoning, deductive logic and problem-solving.

Pass: the candidate shows some limited grasp of at least part of the basic material.

[Note that the aggregation rules in some circumstances allow a stronger performance on some papers to compensate for a weaker performance on others.]

Fail: little evidence of competence in the topics examined; the work is likely to show major misunderstanding and confusion, coupled with inaccurate calculations; the answers to questions attempted are likely to be fragmentary only.

Extracts from Examination Conventions 2023-24. Full text available online at

<https://www.maths.ox.ac.uk/members/students/undergraduate-courses/examinations-assessments/examination-conventions>