

Summary of Examiners' Reports for NST Mathematics 1A and 1B 2015

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This report provides a summary of some of the main points made in the Examiners' reports and provides some commentary following a meeting of the NST Mathematics Teaching Committee held on 20 October 2015, at which the reports were discussed.

NST Mathematics 1A

A total of 511 students took this examination, comprising 420 from the Natural Sciences Tripos (NST), 89 from the Computer Science Tripos (CST) and 2 from the Education Tripos (ET). 4 NST students and 2 CST students withdrew. Last year there were 502 students, comprising 422 NST, 76 CST and 4 ET.

There were no reports of misconduct. One question required a clarification to remove an ambiguity that became apparent after the exam began.

Three Assessors from DAMTP assisted the examiners in marking selected questions, each under the supervision of the Examiner who had set the question concerned. Questions were assigned to Assessors to even out the marking load of different Examiners.

The median raw mark (out of 240) had climbed steadily between 2008 and 2012 from 131 to 182 but has reduced significantly in the last three years:

2008	2009	2010	2011	2012	2013	2014	2015
131	140	162	170	182	150	160	151

The two papers were of roughly equal difficulty, with mean scores of 72.5, 75.3 and median scores of 74, 77 (out of 120).

Last year, an appeal from a student resulted in the discovery of a subtle error in the spreadsheet used for processing the marks. Corrections had to be made after the results were announced. In 2015 the Examiners used several independent methods to process the marks. Scaling of marks was performed using both a spreadsheet and a custom-written computer code. The two methods were found to be consistent. The Senior Examiner also performed the scaling by hand for a selection of candidates, again with consistent results.

The Examiners provide a list of recommendations. They recommend the introduction of an additional Examiner from the Computer Laboratory, which seems appropriate given the large number of CST candidates. In previous years, the Computer Laboratory has not taken the opportunity to supply an Examiner when invited to do so. The Examiners recommend that, instead of a spreadsheet, a computer code be used in future to process

marks, as in the Mathematical Tripos. In view of the error mentioned above, the Teaching Committee thinks it would be more prudent to continue the practice of using both a computer code and a spreadsheet to perform the scalings, even though this involves more work for the Examiners. The Examiners express a concern about the absence of a large board or screen in the Sports Hall. This would make it difficult to communicate a correction of a technical nature if an error were found in a question. The report of the final Senior Examiners' Meeting for NST IA states that this concern will be referred to the Board of Examinations.

NST Mathematics 1B

164 students sat this exam (166 last year, 163 the year before). A query from a candidate revealed that a question near the end of Paper 2 was missing an important piece of information. The extra information was supplied in an announcement made 45 minutes after the start of the Examination. There was no evidence that this adversely affected any candidates.

There was a small problem with the "Stationary Requirements" listed on the Papers: it was incorrectly stated that one cover sheet was required for each question, rather than one for each Examiner. This slowed down the collation of scripts for Paper 1. For Paper 2, the Examiners ensured that each candidate had only 3 cover sheets.

Following the practice introduced last year, each Examiner checked the questions set by one other Examiner without the aid of solutions. The questions and solutions were then sent to Lecturers for comment, and revisions made where deemed appropriate. The Examiners then carefully checked all questions together.

The Examiners felt that difficulty of the examination was comparable to recent years, with the exception of the 2014 examination, which was felt to be harder than typical.

After marking, a consideration of borderline candidates led to the Examiners performing a small rescaling which reduced the number of Fails from 6 to 4. In NST IB there is a procedure for comparing the marks of the cohort of students taking a particular subject (in this case Mathematics) with the performance of the same cohort in IA. The cohort taking IB Mathematics is typically strong and therefore expected to perform well at IB. The performance in the 2015 IB Mathematics exam was found to lie within the targets based on the IA cohort performance and so no further rescaling was required. The result was a mean mark of 66.4% with the number of candidates in each class as follows: I 40.9%, II.1 26.2%, II.2 20.1%, III 10.4%, Ordinary/Fail 2.4%.