

Summary of Senior Examiners' Reports for NST Mathematics 2017

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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 26 October 2017, at which the reports were discussed.

NST Mathematics IA

A total of 502 students took this examination, comprising 413 from the Natural Sciences Tripos (NST), 88 from the Computer Science Tripos (CST) and 1 from the Education Tripos (ET). In 2016 there were 524 students, comprising 444 NST, 80 CST and 0 ET.

There were no reports of misconduct.

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 declined significantly from 2013 to 2016, with the 2016 papers being especially difficult. The teaching committee encouraged the Examiners in 2017 to set papers which reversed this decline in raw marks, which they succeeded in doing:

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Median/240	131	140	162	170	182	150	160	151	137	160

The two papers were of roughly equal difficulty, with mean scores of 76.4, 81.7 and median scores of 77, 83 (out of 120). It is pleasing to see that candidates performed well on Section A questions, which are supposed to be short and straightforward, achieving median marks of 15 and 14 on paper 1 and paper 2 respectively.

Scaling of marks was performed using a custom-written computer code, which outputs the marks onto a spreadsheet.

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. [Update (Nov 2017): it appears that the Computer Laboratory will be able to supply an Examiner for the 2018 exam.]

In 2016, the Examiners expressed concern about the absence of any means of displaying corrections in the Sports Hall. In 2017, white boards were available in the Sports Hall but the Examiners said that not all candidates would have been able to see them easily had the need for announcing corrections arisen (it did not). There was a problem with the PA system not

functioning correctly, with some candidates having difficulty hearing announcements. The Examiners also felt that desks were spaced too closely together, raising the possibility of copying. The teaching committee has asked the undergraduate office to follow up these concerns with the relevant University office.

The Examiners expressed concern about the late arrival of marks for the Scientific Computing practicals (run by the physics department). These marks need to be combined with the IA Mathematics mark so the late arrival, and the format, of these marks caused a delay in the mark processing. The teaching committee recommended that the Senior Examiner for IA NST Mathematics in 2018 should raise this issue with the chair of IA NST Examiners in order to avoid a repeat of this problem.

NST Mathematics IB

Following the practice of previous years, 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.

152 candidates sat this exam (there were 168 last year, 164 the year before). No problems arose during the exam, which consisted of 2 papers. However, there was an ambiguity in the wording of one part of question 6 on paper 1. All candidates attempting this part were awarded the full 5 marks. (Each paper carries a maximum of 120 marks.)

In 2016, paper 1 was very difficult compared to previous years, so the teaching committee encouraged the examiners to set more straightforward papers in 2017. The results in 2017 were mean raw marks of 78.2% on paper 1 (53.7% in 2016) and 75.5% on paper 2 (69.7% in 2016). These high marks indicate that the papers were perhaps *too* straightforward in 2017, with 77.6% of candidates scoring higher than 70% when averaged across the two papers.

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. Nevertheless, some downward scaling of marks was found to be necessary in order to meet the targets based on the IA cohort performance, with the I/II.1 boundary set at a raw mark of 80.3% and the II.1/II.2 boundary at 70.8%.

The final result after rescaling was a mean mark of 70.4% with the number of candidates in each class as follows (2016 figures in brackets): I 48.7% (42.9%), II.1 27.6% (29.8%), II.2 19.7% (19.6%), III 3.3% (6.0%), Ordinary/Fail 0.7% (1.8%).

The Examiners expressed concern about the absence of any means of displaying corrections in the Guildhall. The teaching committee has asked the undergraduate office to follow this up with the relevant University office, along with similar concerns relating to the IA exam (see above).