



External Assessment Report 2010

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| Subject | Mathematics |
| Level | Advanced Higher |

The statistics used in this report are pre-appeal.

This report provides information on the performance of candidates which it is hoped will be useful to teachers/lecturers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding. It would be helpful to read this report in conjunction with the published question papers and marking instructions for the Examination.

Comments on candidate performance

General comments

Overall, candidates seemed adequately prepared for this year's question paper.

There were relatively few candidates who scored very low marks and, similarly, fewer candidates achieved really high scores than in previous years. Candidates handled routine questions well and the more challenging questions allowed the more able candidates to demonstrate their ability. All questions appeared to perform as expected. There is evidence that candidates were well prepared for the demands of the external assessment.

Areas in which candidates performed well

Candidates generally achieved high scores in the following questions:

Questions 1, 2, 3 (b), 6, 7, 9, 11, 13 (in the early parts), 14, 15 (in the first part).

Please refer to the question-by-question comments below.

Areas which candidates found demanding

Candidates found the following questions demanding:

Questions 3(a), 4, 5, 8, 10, 12, 14, 15 and 16.

Please refer to the question-by-question comments below.

Advice to centres for preparation of future candidates

Centres are advised to encourage candidates to practise as much as possible using SQA Past Papers, which are available from SQA's website.

Prelim papers should be set to reflect the structure and duration of the actual question paper as far as possible. The longer questions should be 'holistic', and not simply two (or more) short questions put together.

The following comments on a question-by-question basis are intended to assist centres.

Question 1

Nearly all candidates knew how to approach this question, with the majority gaining full marks.

Question 2

The common ratio and the first term were identified by most candidates, although some were not able to explain why the sum to infinity exists for this series.

Question 3

In part (a), many candidates produced an answer which involved log. Part (b) was well done.

Question 4

Some candidates found this question challenging; this relatively small part of the syllabus may not have been given sufficient emphasis.

Question 5

This was one of the most challenging questions for most candidates. Although intended as an extension of a standard result, many did not recognise the notation or context.

Question 6

The majority of candidates correctly performed the routine process required.

Question 7

Most candidates gained full marks although the initial algebra and the subsequent integration held a degree of challenge. Some failed, however, to reduce the fraction to its lowest terms.

Question 8

Both parts of this question proved challenging although there were a few good responses.

In part (a), candidates had difficulty knowing how to prove something which was obviously true and most did not set up a pair of distinct odd factors and then show that the product was odd.

In part (b), some candidates started the proof correctly, but were unable to complete it.

Question 9

Candidates used a wide range of successful strategies and many achieved full marks.

Question 10

Many candidates did not have a secure understanding of the meaning of odd and even functions.

Question 11

This question proved to be a little more demanding than anticipated. The complex roots in the auxiliary equation may have contributed to this. Where candidates had an incorrect general solution, it was difficult to access the final two marks.

Question 12

This proved to be the most challenging question in the paper. Most candidates did not appear to have secure knowledge of what characterises a rational number.

Question 13

Most candidates were able to obtain a simplified version of the first derivative but were unable to obtain the second derivative.

Question 14

Most candidates were able to obtain the first four marks but had difficulty accessing some of the later marks. Some candidates did realise that the last few marks were still accessible but there were few complete solutions.

Question15

Many candidates accessed most of the first five marks but were unable to obtain the volume of revolution. This did not seem to be primarily due to the rotation being about the y -axis.

Question16

Most candidates failed to access the first three marks and then did not attempt the remaining parts of the question. Perhaps because it was the last question, relatively few candidates attacked solving the equation with sufficient vigour. In a different situation, $z^3 = 8$ would be a straightforward cubic to solve. Viewed in the correct way, the final parts are very attractive.

Statistical information: update on Courses

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|------------------------------------|------|
| Number of resulted entries in 2009 | 3027 |
| Number of resulted entries in 2010 | 2935 |

Statistical information: performance of candidates

Distribution of Course awards including grade boundaries

| Distribution of Course awards | % | Cum. % | Number of candidates | Lowest mark |
|-------------------------------|-------|--------|----------------------|-------------|
| Maximum Mark — 100 | | | | |
| A | 20.7% | 20.7% | 608 | 67 |
| B | 20.1% | 40.8% | 590 | 56 |
| C | 23.5% | 64.4% | 691 | 45 |
| D | 11.2% | 75.6% | 330 | 39 |
| No award | 24.4% | 100.0% | 716 | — |

General commentary on grade boundaries

While SQA aims to set examinations and create marking instructions which will allow a competent candidate to score a minimum of 50% of the available marks (the notional C boundary) and a well prepared, very competent candidate to score at least 70% of the available marks (the notional A boundary), it is very challenging to get the standard on target every year, in every subject at every level.

Each year, therefore, SQA holds a grade boundary meeting for each subject at each level where it brings together all the information available (statistical and judgemental). The Principal Assessor and SQA Qualifications Manager meet with the relevant SQA Head of Service and Statistician to discuss the evidence and make decisions. The meetings are chaired by members of the management team at SQA.

The grade boundaries can be adjusted downwards if there is evidence that the exam is more challenging than usual, allowing the pass rate to be unaffected by this circumstance.

The grade boundaries can be adjusted upwards if there is evidence that the exam is less challenging than usual, allowing the pass rate to be unaffected by this circumstance.

Where standards are comparable to previous years, similar grade boundaries are maintained.

An exam paper at a particular level in a subject in one year tends to have a marginally different set of grade boundaries from exam papers in that subject at that level in other years. This is because the particular questions and the mix of questions are different. This is also the case for exams set in centres. If SQA has already altered a boundary in a particular year in say Higher Chemistry this does not mean that centres should necessarily alter boundaries in their prelim exam in Higher Chemistry. The two are not that closely related as they do not contain identical questions.

SQA's main aim is to be fair to candidates across all subjects and all levels and maintain comparable standards across the years, even as Arrangements evolve and change.