



Course Report 2016

Subject	Mathematics
Level	Advanced Higher

The statistics used in this report have been compiled before the completion of any Post Results Services.

This report provides information on the performance of candidates which it is hoped will be useful to teachers, lecturers and assessors in their preparation of candidates for future assessment. 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 assessment documents and marking instructions.

Section 1: Comments on the Assessment

Component 1: Question paper

The paper consists of sixteen written response questions with a total maximum possible mark of 100. With the exception of questions 9 and 13, the question paper performed very closely to expectations.

Candidates found the questions and 13 more straightforward than anticipated. Grade boundaries were therefore set at 53% for a C and 73% for an A.

Section 2: Comments on candidate performance

Areas in which candidates performed well

Component 1: Question paper

Questions 1, 6, 13, 14 and 15 were done well by the majority of candidates.

Areas which candidates found demanding

Component 1: Question paper

- ◆ Question 2(b): it was disappointing that many candidates did not know why the associated geometric series had a sum to infinity.
- ◆ Question 3: many candidates were unable to write down the general term. Of those who wrote down the general term, many could not simplify. Algebraic manipulation posed problems for candidates. Although this type of question has appeared in the past, it was disappointing that many chose to write out a full expansion. The majority of candidates erroneously included the summation sign in the general term.
- ◆ Question 4: it was clear that the term 'redundancy' was not known to many candidates.
- ◆ Question 5: it was disappointing that the proof by induction did not perform as well as expected — especially the last two marks. There appeared to be a lack of understanding, formality and rigour in both the process and communication.
- ◆ Question 7: The determinant posed no problem for candidates. However, candidates were challenged by the matrix algebra in parts (b) and (c).
- ◆ Question 8: Although part (a) was done well, candidates, in general, were unable to handle the constant 'a' in parts (b) and (c).

- ◆ Question 9: candidates in general knew what to do, but got tangled up with incorrect use of signs and the second application of integration by parts.
- ◆ Question 10: this performed as expected considering that proofs, in general, are challenging. Candidates generally were able to provide a counterexample to show that $2p+1$ was not prime, but were unable to prove part (b).
- ◆ Question 11: this question assessed a challenging area of the course. Many candidates struggled with the interpretation of the question and were unable to make any significant progress.
- ◆ Question 12: many candidates knew what to do but were unable to handle the $-c$. There were many candidates that were unable to start this question.
- ◆ Question 16: it was encouraging to see candidates attempting this question as marks were available. From some candidates there were elegant and insightful solutions. However for many, the interpretation of the context proved to be challenging.

Section 3: Advice for the preparation of future candidates

Component 1: Question paper

Proof continues to be a prominent area with which candidates struggle. Understanding Standards events and, more immediately, the published Marking Instructions for this and other recent years' papers are excellent sources of firm indications of what is required. Candidates need, in many cases, to be given clearer guidance on the need for rigour in proof, and this should start earlier than S6 wherever possible.

Graphicacy and treatment of modulus functions continue to cause problems, and a deeper understanding of these concepts would have benefited many.

Algebra is improving steadily, although there is still no room for complacency. It was noted that many candidates had difficulty in executing straightforward techniques from lower levels, eg factorising quadratics and dealing with indices.

There was evidence that many candidates prepared well for the examination and were clearly familiar with the contents of the formulae list.

Grade Boundary and Statistical information:

Statistical information: update on Courses

Number of resulted entries in 2015	0
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Number of resulted entries in 2016	3356
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Statistical information: Performance of candidates

Distribution of Course awards including grade boundaries

Distribution of Course awards	%	Cum. %	Number of candidates	Lowest mark
Maximum Mark -				
A	41.2%	41.2%	1383	73
B	17.1%	58.3%	573	63
C	15.5%	73.8%	520	53
D	6.9%	80.7%	232	48
No award	19.3%	-	648	0

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, SQA therefore 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 Business Manager 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.