

Principal Assessor Report 2005

Assessment Panel:

Mathematics and Statistics

Qualification area

**Subject(s) and Level(s)
Included in this report**

Mathematics Higher

Statistical information: update

Number of resulted entries in 2004	19,385
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Number of resulted entries in 2005	19,173
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General comments re resulted entry numbers

Numbers remain constant (within 0.5% of the 2004 total).
The number of candidates choosing the Statistics option remained steady at just under 50.

Statistical Information: Performance of candidates

Distribution of awards including grade boundaries

Distribution of awards	%	Cum %	Number of candidates	Lowest mark
Maximum Mark- 130	-	-	-	-
A	22.5	22.5	4,322	98
B	22.0	44.5	4,217	80
C	23.3	67.8	4,467	63
D	9.2	77.0	1,765	54
No award	23.0	100.0	4,402	-

General commentary on passmarks and grade boundaries

- While SQA aims to set examinations and create mark schemes which will allow a competent candidate to score a minimum 50% of the available marks (notional passmark) and a very well-prepared, very competent candidate to score at least 70%, it is almost impossible to get the standard absolutely on target every year, in every subject and level
- Each year we therefore hold a passmark meeting for each subject at each level where we bring together all the information available (statistical and judgmental). 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 senior management team at SQA
- We adjust the passmark downwards if there is evidence that we have set a slightly more demanding exam than usual, allowing the pass rate to be unaffected by this circumstance
- We adjust the passmark upwards if there is evidence that we have set a slightly less demanding exam than usual, allowing the pass rate to be unaffected by this circumstance
- Where the standard appears to be very similar to previous years, we maintain similar grade boundaries
- 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 are different. This is also the case for exams set in centres. And just because SQA has altered a boundary in a particular year in say Higher Chemistry 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
- Our main aim is to be fair to candidates across all subjects and all levels and maintain standards across the years, even as arrangements evolve and change.

Comments on any significant changes in distribution of awards/grade boundaries

The pass mark set at 63 reflected a similar cohort to 2004 with an equivalent level of response to the examination. The examination was deemed to be slightly more difficult at the harder end of the paper and this was reflected in the cut-offs for an A-award and a B-award being 4 marks and 2 marks lower than in 2004. There was a marginal improvement in the responses by candidates in the C/B range which was reflected in the slight increase in the number of B-awards and a slight decrease in the number of C-awards. The number of candidates achieving an A-award remained fairly constant.

Comments on candidate performance

General comments

Taking the examination as a whole, candidates performed much as expected. Most candidates found the number of questions satisfactory although there is little evidence that candidates had any spare time to review previous solutions. Although the prospective C-grade candidate was not expected to complete all the questions, there was evidence that they were able to access the C-marks in the harder questions. There was a measurable improvement in responses at the C/B interface, reflected by the slight increase in B-awards.

Areas of external assessment in which candidates performed well

Questions targeted at the prospective C-grade candidate:

In Paper 1 straight line, circle, vectors, basic wave function and factorising continue to be done well. There was a noticeable increase in the number of candidates who are able to factorise a cubic expression, given a linear factor, without having to resort to synthetic division. In Paper 2 questions on trigonometric expansions, circle and vectors received excellent responses.

Questions targeted at the prospective A/B candidate:

In Paper 2 the area between two curves was well done as was the question involving log manipulation. The cubic with literal coefficients was well tackled by those candidates aiming for an A grade.

In the Statistics questions, box-plots, scatter diagrams and standard deviation were well done.

Areas of external assessment in which candidates had difficulty

Questions targeted at the prospective C-grade candidate:

In Paper 1 the ability to write down the turning point from a quadratic expressed in a “completed square” form continues to prove a major embarrassment with many candidates taking a page of working to find out something that they should be able to state. The interpretation of the logarithmic graph was very disappointing whilst the technique for solving the “ $\cos 2x$ ” equation seemed unknown by three quarters of the candidates.

Questions targeted at the prospective A/B candidate:

In general exact values for the trigonometric functions were not as well known this year as in the past (in particular “tan” values).

In Paper 1 the sketch of the wave function showed a lack of knowledge of the general shape of such curves and the circle /tangent question proved more than a match for most candidates where poor algebra ($(2x)^2$ written as $2x^2$) was far too common.

In Paper 2 many candidates displayed a lack of awareness on how to lay out the proof for the intersecting trig. curves and the results for solving the exponential equation were less than satisfactory. Many candidates simply stopped after making the initial substitutions.

In the Statistics option, questions on probability density functions and general probability were poorly dealt with.

Recommendations

Feedback to centres

1

Candidates need to look at the marks available and ask themselves if they are tackling the question correctly – if a part is only worth 1 or 2 marks then it should not be taking a whole page or working (see P1 qu4b or P1 qu2 where some candidates found the equation of the common tangent and then substituted this into one of the circles).

2

There is evidence from the scripts of many “easy” marks being lost through very basic errors such: using the wrong trigonometric formula; inability to write expressions in a correct form prior to differentiating or integrating; misunderstanding the notation used in recurrence relations; in “show that” questions, not writing down enough evidence; mistaking greatest and least values for maximum and minimum values.

3

The response to the log graph interpretation would suggest that many candidates had forgotten the basics by the time they met this topic again in Unit 3.

4

Candidates who employ a substitution method instead of simply applying the chain rule (eg P1 qu.5) more often than not make more errors than the question is worth.

5

The disproportionate amount of time spent on questions where an inefficient method is used inevitably means that candidates run out of time.