



External Assessment Report 2014

Subject(s)	Mathematics
Level(s)	Intermediate 2

The statistics used in this report are prior to the outcome of any Post Results Services requests

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

The performance of candidates as well as the feedback from centres, candidates and markers suggested that this year's papers were set at the appropriate level and covered a good spread of topics and strategies.

Applications candidates represented less than 20% of the total number of candidates. As in previous years, the candidates sitting Applications did not perform as well as those sitting the 1,2,3 papers.

Areas in which candidates performed well

Paper 1

- Question 1 (both versions): *Equation of a straight line*. Generally well done, with most candidates showing detailed working. This enables partial marks to be allocated more easily, should it be required.
- Question 2 (both versions): *Breaking brackets*. Candidates tended to deal well with this, although a small minority included the '+ 8x' in the multiplication.
- Question 4 (Applications): *Spreadsheets*. Much better performance this year, probably because of the way the question was presented, with 3 options.
- Question 4 (1,2,3) and Question 5 (Applications): (a) *Quartiles*. Most candidates achieved maximum marks.
(b) *Box plot*. Again very well done, although some diagrams (especially among the Applications candidates) were untidy and/or inaccurate.

Paper 2

- Question 1(both versions): *Percentages*. Very well done, although there were a few who forgot to round or rounded incorrectly.
- Question 2 (both versions): *Volume*. Both parts were well done, particularly part (a). Again there were a few rounding errors, especially among applications candidates.
- Question 4 (both versions): *Simultaneous equations*. Tackled well by many. A few lost the final communication mark; these questions in context must have the answers expressed in terms of the context.
- Question 5 (both versions): *Standard deviation*. As usual part (a) of this question was done well by most candidates.

Question 7 (Applications): *Flowchart*. Appeared to be very accessible to candidates.

Question 9 (Applications): *Loans*. Despite the fact that this question involved 'working backwards' many candidates achieved full marks.

Areas which candidates found demanding

Paper 1

Question 3 (Applications): *Networks*. Poor performance here. Many candidates had no idea what 'arc' meant.

Question 3 (1,2,3) and Question 7 (Applications): *Cosine rule*. A common error was to substitute $1/5$ for angle Q instead of substituting $1/5$ for $\cos Q$. Also a significant number of candidates ignored the rules of order of operation and evaluated $7^2 + 5^2 - 2 \times 7 \times 5$ to arrive at 4, disregarding the fact that $2 \times 7 \times 5$ should have been multiplied by $1/5$.

Question 4 (1,2,3) and Question 5 (Applications): *(c) Statistical comment*. Where marks are being offered for a statistical comment / interpretation, candidates should respond in terms of the context of the question, showing some insight into the meaning or implication of the statistics.

Question 6 (1,2,3) *Quadratic curve*. Most candidates knew what strategy to use in this question but confusion with the negative number (and squaring it) led to many losing at least one mark.

Question 8 (Applications): *Formulae*. Non-calculator skills again shown to be weak. Many could not calculate $3.14 \times 5 \times 2$ or $3.14 \times 25 \times 4$.

Question 9 (Applications): *Histogram*. A large number of candidates could not label the axes correctly.

Question 9 (1,2,3) and Question 10 (Applications): *Chord in a circle*. The vast majority knew to use Pythagoras' theorem in a right-angled triangle. However, the actual arithmetic of squaring 15 and 12 proved to be beyond many (this was worse if a mistake had been made and the candidate was required to square 13.5).

Paper 2

Question 3 (both versions): *Factorisation*. This 2-step factorisation proved difficult for candidates, with few gaining full marks.

Question 5 (both versions): *Standard deviation*. In part (b), some candidates did not seem to understand 'consistency' or how it linked to standard deviation.

Question 9 (1,2,3): *Addition of algebraic fractions*. As in previous years, this topic continues to be problematic for many candidates.

Question 10 (1,2,3) and Question 6 (Applications): *Probability*. Few candidates could explain why the given probability was necessarily incorrect, not appearing to realise

that $0 \leq \text{probability} \leq 1$.

Question 10 (Applications): *Commission*. Candidates seemed to be at a loss as to what strategy to use in this question. As a result the calculations shown tended to be random, and although a minority of candidates picked up marks, their working was not usually part of a logical approach.

Question 11 (1,2,3) and Question 8 (Applications): *Trigonometry and bearings*. Part (a) was tackled reasonably well, but part (b) proved more difficult for the candidates.

Question 12 (1,2,3): *Trigonometrical equation*. The initial substitution proved problematic for some. Others gave two answers where only one was acceptable.

Question 13 (1,2,3) and Question 12 (Applications): *Sector and triangle*. Few candidates scored full marks although many picked up partial marks since they could either calculate the area of the triangle or the area of the sector.

Advice to centres for preparation of future candidates

It is clear that centres prepare candidates well for the external examination of Intermediate 2 Mathematics. Generally candidates have a good knowledge of possible strategies and present their working and evidence clearly.

Some advice, relevant to 2014 examination, which may help candidates in future:

- ◆ Where a candidate is asked to **round** to a certain level of accuracy, the final mark will be lost if the rounding is ignored or is incorrect. Most candidates do not find rounding difficult, so remind them to check if it is required in a question so as not to lose marks unnecessarily.
- ◆ Similarly, **simultaneous equations** tend, on the whole, to be well done. Where a simultaneous equations question is set in context, the final mark is awarded for responding in context (eg In Paper 2 Q4, the final mark is awarded for 'A loaf costs £0.85 and a packet of butter costs £1.09'.) Candidates should be encouraged to communicate their answer in context after solving the equations.
- ◆ Paper 1 is a **non-calculator paper** and candidates should be aware that a certain level of arithmetic ability is expected of them. Note Paper 1 Q9 (Q10 in Apps). Candidates should ensure that they do not become 'rusty' as far as their arithmetic skills go. It is also worth noting that when the figures in a calculation are re-arranged, often the calculation is eased.
- ◆ Candidates can sometimes lose marks in **diagrams** (Paper 1 Boxplot; Paper 1 Apps Histogram). Where it is required to draw a diagram, it is expected that candidates will show due care and attention to things like drawing straight lines with a ruler, marking scales on axes, labelling axes. At Intermediate 2 level, marks may be lost for careless, inaccurate diagrams or diagrams that are difficult to read.

Statistical information: update on Courses

Number of resulted entries in 2013	24058
Number of resulted entries in 2014	18297

Statistical information: Performance of candidates

Distribution of Course awards including grade boundaries

Distribution of Course awards	%	Cum. %	Number of candidates	Lowest mark
Maximum Mark 80				
A	33.1%	33.1%	6060	56
B	18.6%	51.7%	3405	48
C	18.0%	69.7%	3290	40
D	7.7%	77.4%	1400	36
No award	22.6%	-	4142	-

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.