



## External Assessment Report 2013

Subject(s)	Mathematics
Level(s)	Standard Grade

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

### Foundation

This paper was viewed as consistent with previous years, being both fair and accessible to candidates. Questions were written in interesting contexts, allowing candidates to attempt all questions and display their knowledge. Both KU and RE elements were well attempted.

### General

This paper was also perceived as fair and accessible. There was a broad coverage in an interesting mix of contexts. Candidates could therefore demonstrate their knowledge across the range of topics examined.

In the RE element, candidates also responded well, with clear working being shown and improving responses when asked to give a reason for their answers.

### Credit

This paper was seen as having good coverage of the Grade Related Criteria, and it proved a very fair examination for appropriately prepared candidates. Markers said there was a good balance of straightforward and more demanding questions, resulting in a very well balanced paper.

Candidates continue to score more highly in the KU element, with trigonometry and circle topics being particularly well done.

## Areas in which candidates performed well

### Foundation Paper 1

This paper was very well attempted.

- 1: The majority of the cohort could complete basic calculations.
- 2: Many candidates could calculate  $\frac{1}{4}$  of 720, though not always by the simplest strategy.
- 3: Candidates had the skills to list various combinations.
- 4: Excellent angle work.
- 5: Money calculation was, as usual, well done.
- 9: Good responses on negative numbers in context.

### Foundation Paper 2

- 2: Candidates demonstrated accurate measurement combined with understanding of use of a scale.

- 3: This was well done by the majority of candidates.
- 4: Good comprehension was shown when marshalling the sets of calendar dates.
- 8a): There were excellent responses in calculation of wage.
- 9: This was fairly well done.
- 11: Calculation of time was well done.
- 13: Candidates coped well with the unfamiliar Mayan number system.

### **General Paper 1**

- 1a), These were reasonably well attempted.
- 5: Completion of a timetable was very well done.
- 6: Candidates showed good understanding of negative numbers in the context of temperature.
- 7: A very well executed question on number patterns. Candidate responses have improved from previous years.

### **General Paper 2**

- 1: Candidates showed good understanding of percentages in a money context.
- 2: The construction of a stem and leaf diagram was particularly well done.
- 4: Overall, there was an excellent response on combinations of vegetables.
- 5: Candidates knew to choose and to apply Pythagoras' Theorem.
- 6: Candidates employed a variety of approaches in this distance, speed, time problem.
- 13: There were many good attempts in the wages question.
- 15: Most candidates could extract the information required to calculate a circumference.

### **Credit Paper 1**

- 1: Basic numeracy was well done.
- 2: The fraction division was fairly well done.
- 5: Candidates showed good understanding of probability.
- 6: The simultaneous equations question was excellent this year.
- 7a): There was continued improvement in expanding brackets and simplifying.
- 11a): Most candidates could continue the number pattern.

### **Credit Paper 2**

- 2: Use of the quadratic formula was generally well done although a proportion of candidates lost a mark as they did not show the unrounded solutions prior to rounding to 1 decimal place. Candidates should always show the calculation which is actually being rounded.
- 4: Proportion was seen as improved from previous years.

- 6: The use of Pythagoras' Theorem followed by the calculation of circumference was very well done.
- 9: There was some excellent trigonometry work concerning the sine rule and right angled trigonometry.
- 10a): Candidates showed understanding of substitution into a formula in function notation.

## **Areas which candidates found demanding**

### **Foundation Paper 1**

- 6: Many candidates simply found the diameter, resulting in only 1 mark for this question.
- 8: Most tried to follow the given pattern but frequently omitted one digit in the answer.

### **Foundation Paper 2**

- 1: This was not well done, with many candidates confusing area and perimeter.
- 5: Candidates confused surface area and volume.
- 6: Candidates did not understand that the fee was per ticket in this online cinema booking problem.
- 8b): The calculation of the number of hours worked at double time proved demanding for many candidates.
- 12: This was done better than previous years but there continues to be confusion between the mean and the mode.
- 14: Many could not convert 35cm into metres. Part b) subsequently was more challenging.

### **General Paper 1**

- 1c): A large number of General candidates could not complete the division by 4.
- 8: Both division by 500 and converting to scientific notation require further practice.
- 10: Many candidates used either a horizontal or a vertical fitting of the rectangles and did not consider a combination of both.

### **General Paper 2**

- 3: The most common error in the calculation of the share of rent was division by 3 instead of by 4.
- 7: The multiplication of the bracket by 4 was relatively well done, although the subsequent gathering of like terms was less successful. In part b), too many candidates could not work with an inequality symbol and were changing it to an equality sign or reversing it erroneously.
- 8: Lack of care in reading the question was evident. Many assumed the special offer was 'buy one, get one free'. Others did not notice that the cartons contained different volumes of orange juice.

- 14: A large number of candidates could not plot points accurately. More, however, did not recognise a negative gradient when they had correctly plotted the points in part a).

### **Credit Paper 1**

- 3: The interpretation of statistical information was poorly done. Credit candidates do need to understand and to compare given statistics.
- 8: Candidates showed limited comprehension. Candidates should be able to rearrange the equation of a line to allow them to extract both the gradient and the  $y$  intercept.
- 9b): Many candidates had difficulty in finding a formula from the given information.
- 10b): Many candidates gave the answer 1 or the coordinates of the turning point when asked to find the equation of the axis of symmetry.
- 11b): Candidates exhibited a lack of understanding of the concept of a mathematical proof. The substitution of one value into a formula does not constitute a proof.

### **Credit Paper 2**

- 1: Candidates had difficulties in converting to the appropriate units.
- 5: Substitution into the area formula requires more practice.
- 10b): Many candidates again substituted erroneously when having to solve for  $m$ . Others who did substitute correctly lacked knowledge of indices.
- 14: This was very poorly attempted. Most candidates started the proof but could not continue as they were not able to square the term  $2x$ .

## **Advice to centres for preparation of future candidates**

We are continuing to see candidates who have been well prepared, in both knowledge and reasoning, for their examinations. They are practised in showing all working and, when required, in the communication of a reason for their answer. They are gaining confidence in the application of a wider variety of strategies, and teachers should be congratulated for their work in supporting their students this far.

At Foundation level, candidates have worked hard and have been successful in their basic calculations, fraction work, money topics, measure and time. The necessary repetition of concepts and calculations at this level should be continued to allow candidates' confidence to grow.

Further work is required on the circle (as also found last year), area, perimeter and volume topics and metric units. These topics are covered from first year until fourth year, but Foundation candidates continue to need frequent repetition. Centres should consider how best to order the teaching of perimeter, area and volume to minimise confusion over these concepts.

Communication of reasons and writing steps of working continue to improve. Yet again this year, it is evident there are many centres in which Foundation candidates have been very well supported.

At General level, candidates are performing very well in percentages, money, stem and leaf diagrams, Pythagoras' Theorem and circle topics. The necessary ongoing practice and review of General topics supports students when they come under examination conditions.

Division by multiples of 10 and 100 requires more time. When teaching inequalities, it may be advisable to avoid the reversal of the sign. By initially ensuring the coefficient of  $x$  is always positive, the solution of both equations and inequalities then follow the same strategy. The course should include as much repetition and consolidation as possible.

At Credit level, candidates perform confidently in basic number work, simultaneous equations, Pythagoras' Theorem, quadratic formula, trigonometry and circle topics. Further work is required in interpretation of statistics, the line and its gradient and mathematical proof. There continues to be room for improvement in algebra. Again, as with all levels in mathematics, continued practice increases confidence.

## Statistical information: update on Courses

### Standard Grade Mathematics

Number of resulted entries in 2012	40879
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Number of resulted entries in 2013	38684
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## Statistical Information: Performance of candidates

### Distribution of overall awards

Grade 1	19.8%
Grade 2	16.5%
Grade 3	27.5%
Grade 4	15.5%
Grade 5	14.7%
Grade 6	5.0%
Grade 7	1.0%
No award	0.1%

### Grade boundaries for each assessable element in the subject included in the report

Assessable Element	Credit Max Mark	Grade Boundaries		General Max Mark	Grade Boundaries		Foundation Max Mark	Grade Boundaries	
		1	2		3	4		5	6
KU	45	37	25	40	30	21	40	27	19
RE	45	30	20	40	30	23	40	23	15