



## External Assessment Report 2012

Subject(s)	<b>Mathematics</b>
Level(s)	<b>Standard Grade</b>

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 perceived as fair and accessible to the majority of the cohort. Markers felt the responses were 'good' to 'very good'. Candidates continue to show working and there was an improvement in questions requiring a reason to be given for the chosen response. There were fewer papers with very low marks and few omissions of questions. Both the KU and RE elements were well attempted with the RE questions in Paper 1 being particularly well done. There was an increase in the percentage of candidates who gained a grade 5 and a decrease in grade 6 and 7.

### General

Again, this paper proved accessible to candidates. Both KU and RE elements were well attempted and candidates demonstrated their knowledge across the range of topics examined. Certain areas, mentioned below, do require more time to ensure candidates achieve fuller understanding. KU and RE results were consistent with performance in previous years.

### Credit

This paper was seen as a fair examination for candidates who had completed the Credit Course. There was good coverage of the GRC and Markers commented on improvements in some areas. Also, candidates were employing a wider range of strategies in RE questions. Paper 1 was seen as more challenging than Paper 2. As in previous years, candidates scored higher in the KU element.

## Areas in which candidates performed well

### Foundation

#### Paper 1

Questions 1–4: These were very well done by the majority of candidates.

Question 6(a): The 24 hour time answer was done very well.

Question 7(a), (b): Interpretation and completion of the graph were well practised and well understood.

Question 8: Good comprehension shown in this unusual context.

#### Paper 2

Questions 1–5: Again, candidates made an excellent start to the paper.

Question 7(a): As in previous years, the completion of a table was very well done.

Question 8: Excellent recognition of the net of a cuboid.

Question 9: Coordinate work was well understood.

Question 11(a): Recognition of number pattern.

Question 14: Candidates understood concept of negative temperatures.

Question 17(a): Good understanding of calculation of a cost price.

## **General**

### **Paper 1**

Question 1(c): Division by a single digit

Question 3(a): Completion of table was well done by most candidates.

Question 4(a): Candidates recognised multiples of 7.

Question 5: Temperature difference was well understood.

### **Paper 2**

Question 3: Extraction of information from a table — in a money context — was extremely well done.

Question 5: Another money question in which candidates showed a variety of appropriate reasoning skills.

Question 8: Good comprehension of using a payment plan.

Question 9: Algebra skills are improving.

Question 10: Calculation of the mean was well done.

Question 11: Choosing suitable scale and drawing of the bar chart were particularly well done.

## **Credit**

### **Paper 1**

Question 1: Very well done.

Question 2: An improvement in the algebraic expansion.

Question 4: Pythagoras' theorem with surd simplification.

Question 9(a): Algebraic expression of time.

Question 11(a): Continuing an unfamiliar number pattern.

### **Paper 2**

Question 1: 'Compound interest' question continues to be well done (although some candidates could not write 2.69 million in full).

Question 3: Calculation of volume in cubic centimetres was well done.

Question 4: Arc work was well understood.

Question 7: Use of sine rule.

Question 11: Pythagoras and cosine rule were well practised by candidates.

Question 12(a): Good substitution into trigonometric function.

## **Areas which candidates found demanding**

### **Foundation**

#### **Paper 1**

Question 5: Candidates were confused over meanings of radius and diameter. The question also exposed lack of understanding of which calculation was required to find the height ( $3 \times 12 = 36$  was a common wrong answer).

Question 7(c): Many candidates did not know how to describe the trend of a graph ('line graph' was common response).

#### **Paper 2**

Question 6: Mixed responses in this percentage question. Division by 5 was common, even with candidates who had shown in Paper 1 (Q1(c)) that they had understood the concept of

a percentage. This underlines the necessity of ensuring candidates have the different skills of calculating a percentage both with access and without access to a calculator.  
Question 7(b): Finding the rule for a number pattern continues to need more time. Could the rule to a given number pattern be done in lesson starters?  
Question 12 (b): Calculation of the area of a rectangle continues to prove difficult.

## **General**

### **Paper 1**

Question 1(a): Very poorly done. Candidates blindly follow Bomdas/Bodmas and usually add  $5 \cdot 3$  to  $3 \cdot 21$  before subtracting their answer from  $14 \cdot 6$ . Acronyms are useful but candidates should know that addition and subtraction have parity when deciding order.  
Question 1(d): Fraction work still requires more attention, although this addition was done slightly better than in previous years.  
Question 2: As with Credit candidates, the main problem here was in writing the number  $27 \cdot 2$  million in full.  
Question 4 (b), (c): Poor understanding of what a prime number is. Some candidates could write out a list of square numbers but then did not choose 50 as being closest.  
Question 9: Difficulties in finding a time difference over midnight.

### **Paper 2**

Question 4: Bearings were not well understood. Some candidates appeared only to have seen the basic compass directions N, S, W and E.  
Question 6: Candidates had difficulties in both the completion of the table and the drawing of a line.  
Question 10: The final mark for giving a reason was frequently lost.  
Question 13: For some candidates there was confusion between the height with the hypotenuse.  
Question 14: Area of the circle was reasonably done. The difficulty lay in the calculation of the side of a square, given the area.

## **Credit**

### **Paper 1**

Question 5: Again, candidates had difficulty in making a comparison between the goal scoring rates and hence communicating a reason.  
Question 6: Many candidates did not realise that an equation should contain an equals sign. An answer of 2 was common. Knowledge of basic quadratic theory was limited.  
Question 7: Use of the quadratic formula in Paper 1 was certainly unexpected for many candidates. Errors in substitution and lack of clarity of steps taken to achieve the given roots were very common.  
Question 8: Poor skills in algebraic manipulation were exposed in this question on intersection of lines.  
Question 9(c): Candidates had difficulty in subtracting algebraic fractions.  
Question 10: Many candidates did not know what the word 'Evaluate' meant, leaving their answers in index notation. Others did not have the knowledge required to make the evaluation. This area continues to be poorly attempted.  
Question 11(b), (c): Candidates were poor in finding a general expression in the number pattern. In the final part only very few noticed that the given number pattern did not start with  $2 + \dots$

## **Paper 2**

Question 2: Very poorly done. Candidates did not know how to calculate the semi-interquartile range and found difficulty in comparing performances.

Question 3: Too many Credit candidates could not make the final step of converting to litres; very disappointing at this level.

Question 5: Some candidates had difficulty in writing an equation for the joint variation conditions.

Question 9: Although a variety of acceptable methods were used, too many candidates did not know the properties of a rhombus. (Equilateral triangles were frequently assumed.)

Question 12(b): The solution of trigonometric equations requires more time to ensure students have greater confidence in this area.

Question 13(b): Candidates were starting this by factorisation but did not always respond to the stated conditions.

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

Teachers in centres should firstly be congratulated in giving candidates the knowledge and the confidence to apply a wider range of strategies to problem solving. It is very encouraging to see candidates engaging with new methods.

At Foundation level, candidates are performing well and the hard work of both teachers and their students is evident. The necessary repetition of concepts and calculations at this level should be continued to allow candidates' confidence to grow. Evidence from this year indicates further work is required on the circle, trend in a graph, calculation of a percentage with a calculator, and the rule for a number pattern. These topics merit frequent repetition for the true Foundation candidate but progress can be made. Communication of reasons and writing steps of working clearly continue to improve. It is evident there are many centres in which Foundation candidates are very well supported.

General candidates are performing very well in both money and trigonometry topics and algebra skills are improving. The repetition and extended practice encouraged by teachers allows candidates to access their knowledge under examination conditions. These teaching practices do work and should be continued. Order of operations, fraction work, time difference, bearings and equation of a line are less secure and do need more time spent on them. The list of General topics is extensive, but short and frequent review of perhaps only parts of a topic can help consolidate learning.

At Credit level, candidates perform confidently in basic number work, volume, trigonometry and circle topics. At this level, ongoing familiarity (throughout S3 and S4) with past paper questions is vital. Introduce exam-type questions as they complete each topic. Improvements in statistics, algebra, quadratic theory and indices are needed. Credit candidates also need frequent exposure to topics previously completed. As we know, initial comprehension does not always lead to secure retention.

Excellent work is being done across Scotland. Build on this, alongside more frequent recapping of topics previously done.

# Statistical information: update on Courses

## STANDARD GRADE

Number of resulted entries in 2011	42,651
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Number of resulted entries in 2012	40,879
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## Statistical information: performance of candidates

### Distribution of overall awards

Grade 1	18.2%
Grade 2	15.2%
Grade 3	26.8%
Grade 4	16.0%
Grade 5	19.2%
Grade 6	3.9%
Grade 7	0.8%
No award	0.0%

### 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	35	23	40	30	21	40	27	19
RE	45	30	20	40	27	19	40	26	18