Examiners' Report

Summer 2014

Pearson Edexcel GCE in Further Pure Mathematics FP1R (6667/01R)

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Mathematics Unit Further Pure Mathematics 1

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General Introduction

The standard of work was high with a lot of well organised and clear solutions. Diagrams would have helped students make better progress in question 7 and greater attention to accuracy in arithmetical calculations was often needed with matrices.

Report on Individual Questions

Question 1

A large majority of students made a reasonable start to the paper and were able to write down $1 - 2\mathrm{i}$. Some students then found it difficult to form a quadratic factor. Those that did form a quadratic found the linear factor $2z + 1$. After this good work a proportion of students did not go on to state that $z = -½$.

Question 2

In Q02(a) students often gained full marks with the use of degrees rather than radians being the most common error. Some students gained most of the marks but then omitted to round their final answer to the required degree of accuracy. Some students were confused in their approach to linear interpolation and made a sign error without quoting a correct formula so they gained no credit.

In Q02(c) the majority of students made some progress towards the correct interval by finding the first two values, but inaccurate calculations meant they then made incorrect decisions for subsequent values.

Question 3

Incomplete descriptions of the correct transformation meant marks were lost in Q03(a). The most common error was to miss the origin and hence lose the first mark. The majority of students knew the correct matrix for the enlargement Q03(b) with the occasional swapping of elements of omission of correct signs. In Q03(c) ‘14’ was seen very often and then an attempt was made with the determinant. A number of students then did not know how to proceed and lost the final marks for this part.

Question 4

Almost all students knew they were required to multiply through by the conjugate of the denominator in Q04(a), but some lost out accuracy to sign errors or not collecting terms correctly. There were a number of students who did not present the solution in the required form. In Q04(b) there were some confused attempts with the argument of a complex number, but most students realised that the real and imaginary parts had to be equal and made some progress. If accuracy was lost in Q04(a) then this impacted on the accuracy marks awarded here too.

Question 5

The first three marks were regularly awarded to students with the expansion of brackets and the use of the summation formulae carried out accurately. However a number of students failed to spot the obvious factors and decided to multiply out to a cubic or quartic. This was recovered by some with detailed working from a cubic, but other simply quoted the given answer and moved on which did not gain full marks. The majority of students produced fully correct solutions in Q05(b) and 1619910 was seen very often. A minority struggled as they did not see the link to Q05(a), while other lost accuracy as they subtracted the sum of ten terms rather than nine.

Question 6

This was expected to be a good source of marks for all students, but unfortunately accuracy was an issue for some students. In Q06(a) sums, differences and/or products of matrices often had inaccurate elements which lost at least two marks. In Q06(b) a number of students did not take the importance of the order of matrix multiplication into account and a large number could not find an inverse of a 2 x2 matrix accurately. Those students who decided to use simultaneous equations were less likely to produce an accurate answer due to accuracy errors.

Question 7

Q07(a) was answered well with full solutions leading to the given answer. However, a large number of students did not write down the correct answer with sign errors on the right hand side of the equation being very common. This impacted on the accuracy of Q07(c) as students often attempted to solve their two equations simultaneously rather than using $y = 0$ at the intersection of the two straight lines. Students who had a correct answer in Q07(c) typically went on to gain all the marks in Q07(d). Those who were successful usually drew a sketch which helped with the formulation of the area. Students who did not draw a sketch usually struggled without any visual clues and usually missed out the factor of 2 in their areas. Some weaker attempts showed good exam technique and did well to salvage a mark by writing down and labelling the coordinates of the focus.

Question 8

This question proved to be challenging for some students. If a student realised they needed to substitute their coordinates of the intersection into the formula for the line, they usually found the coordinates, although sometimes these were presented with sign errors.

Question 9

This proved to be a demanding induction question. In Q09(a) some students were confused over the method of adding the $(K+1)^{th}$ term. However once they did so correctly they almost always completed satisfactorily. Q09(b) was a challenge for a large number of students and many did not show the statement to be true for both $n=1$ and $n=2$. The majority of students could not make any progress with $U_{(k+2)}$ or were unable to handle the powers of 4 and 2. If the students had done the earlier work correctly then they usually produced a correct final statement. Those with incorrect final statements usually had made significant errors earlier in the question.

Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:

http://www.edexcel.com/iwantto/Pages/grade-boundaries.aspx

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