



General Certificate of Education

Use of Mathematics 5351

UOM4/2 Applying Mathematics Paper 2

Report on the Examination

2010 examination - June series

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Applying Mathematics Paper 2 (UOM4/2) Examination

General

Each year questions on this paper focus on situations that can be modelled by a small range of mathematical functions as well as examining candidates' knowledge of recurrence relations and simulations. This year, linear functions and trigonometric functions were examined in some detail with exponential functions and logarithms being examined on UOM 4/1. In general, candidates responded well to questions relating to linear functions but much less well to those about trigonometric functions: they are often under-prepared to work with the latter. Candidates should be much more careful in presenting their work as they often gain no credit if they have an incorrect answer and their working cannot be followed or understood.

Question 1

This question focused on direct proportion and linear models and was relatively well done by many candidates: this was satisfying as in previous years such questions have been answered less well. In general, most candidates were most comfortable when working directly with numbers rather than when giving answers as formulae, although many gave these correctly. A small number of candidates lost marks by giving algebraic expressions rather than the required conversion formulae, and others lost marks when sketching the graph required in part (b)(iii). When asked to sketch a graph it is important that candidates label axes and clearly indicate the coordinates of any significant points (in this case the intersection of the line with the t axis).

Question 2

Many candidates made considerable progress with this question, although the majority did not always use the correct notation when working with recurrence relations: for example, few showed that they were calculating A_1 , A_2 , A_3 and so on. A small but not insignificant number of candidates did not understand the notation and thought that in the case of A_{n+1} , they were required to add one to the numerical answer that they found. A number of candidates did not work accurately enough so were not able to round to the correct answer. In this case it was not sufficient to work with the rounded values given in the table and this was made clear in the question. Many candidates understood the limitations of the model and were able to suggest suitable ways to make it more realistic.

Question 3

As in previous years, this question based on trigonometric functions was not well done. In answering part (a), some candidates wanted to simply use values from the table rather than consider the function given. This first part of the question was very straightforward for those who understood the structure of trigonometric functions and how to easily determine their maximum and minimum values. Most candidates understood how to proceed on part (b) although not all were successful. Those who used the functions of their graphic calculator to arrive at a result (perhaps using a graph and zooming in to find the answer) were not always accurate enough and needed to be aware that answers without working might gain no credit. A number of candidates worked with their calculator in radian mode and could not gain full credit. The vast majority of candidates did not use correct terminology in describing the transformations required in part (c). This particular question was marked generously, allowing such inaccurate use of mathematical language at this point, but was penalised in the award of marks for notation and argument.

Again there was a disappointing response to the requirement to sketch a graph given that candidates should have had access to a graphic calculator. Candidates were expected to give

the correct shape of the curve and clearly indicate significant features: in this case the maxima and minima of the wave and to the period. Axes should also have been labelled.

Question 4

As in previous years, this question proved accessible to almost all candidates who were generally successful. Some lost marks due to careless working: for example, having customers being served before they had arrived. Those who took great care were often able to gain all of the marks for parts (a), (b) and (c). In part (d) it was important for candidates to try to support their answer to the question regarding which queue they would advise Jack to join with some quantitative reasoning. Responses to part (e) were generally better than those to similar questions in previous years, suggesting that candidates understood in some detail the situation that was being simulated.

Notation and Argument marks

It was felt that over all, candidates' work this year indicated less attention to communication of mathematics. Many candidates gave answers that paid little attention to the units of quantities, did not label axes of graphs and did not make clear the steps in their mathematical reasoning.

Mark Ranges and Award of Grades

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