

Version



**General Certificate of Education (A-level)
June 2012**

Use of Mathematics

UOM4/2

(Specification 5350)

Applying Mathematics Paper2

Report on the Examination

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General

This paper in combination with that for UOM4/1 examines the main areas of algebra and graphs that are core to the mathematics of the AS as a whole. Candidates are expected to be able to apply these in a range of contexts. This year, disappointingly, it seems that many candidates lacked confidence when working with basic functions such as straight lines, quadratics and exponential functions. Also many did not work carefully enough when dealing with the recurrence relations of question 3 and the simulation of question 4. It is important with these questions to work very carefully as errors can be compounded if this is not the case. This lack of care was reflected in the marks given for the use of notation and development of mathematical reasoning and argument.

Question 1

Many candidates were able to gain some credit in part (a) of this question as they verified that the two points shown on the graph satisfied the given equation of the straight line. A more general attempt to find the equation of the straight line was less common. In part (b) (i) many candidates correctly identified the term ns but handled the 50 000 wrongly as they forgot to take account of the fact that the expression should be for 1000s of pounds. Very few candidates then performed the relatively straight-forward substitution and expansion required in part (b) (ii). The final sub-part of (b) was accessible to candidates even if they had been unsuccessful with the earlier two sub-parts and many took advantage of this to correctly calculate the profit.

A disappointing number of candidates could solve the quadratic equation in part (c).

In the final two parts of the question in which candidates were expected to work with the completed-square form of the quadratic, only a small minority were comfortable although some candidates persevered and met with some success using a variety of methods in part (e).

Question 2

Exponential functions are an important part of the specification and overall the response to this question was disappointing. Many candidates made a good start using substitution to verify the result given in part (a). Not many understood the implications of half-life to be able to answer part (b) easily with most attempting, with varying degrees of success, to calculate the answer using the method that had been expected, if not always used, to answer part (b). A disappointing number of candidates were able to calculate the relatively straight-forward calculation required in part (c). Part (d) proved even more challenging.

Again, as in UOM4/1, the sketch graph required here needed to be carefully drawn to identify clearly all significant features including the asymptote. This needs to be indicated carefully. Many candidates failed to identify the intercept with the vertical axis. In interpreting the graph of the situation it is important that candidates consider the shape of the graph and the resulting distinctive features: in this case, the fact that the substance decays rapidly at first, much more slowly after a while and that it never fully decays.

Question 3

This recurrence relation question proved accessible to more candidates than questions 1 and 2 although a substantial number did not work accurately enough, and the common error of thinking that the “–1” in the subscript notation means that one should be subtracted from the value continues to persist over the years. The very straight forward part (a) of the question was successfully answered by almost all candidates and part (b) was answered with varying degrees of success. It seemed that many candidates probably understood why the recurrence relations were in the form given but were unable to express themselves clearly. Many were able to show the results given in part (c) but of these some did not transfer these to the table and consequently were unable to gain full credit in part (d). A disappointing number of candidates were able to complete the table correctly with many making a slip in their calculations.

Question 4

This simulation question was answered successfully by fewer candidates than in previous years. A few made careless mistakes in completing the queuing column of the tables particularly in the second table where they failed to take account of the assumption that if the queues are the same length at each pay station the driver should join the queue at pay station 1. However, a disappointing number of candidates were unable to make much progress at all in completing the tables: this is an important part of the assessment of this component and these candidates appear to have been ill-prepared for it. The final part of the question is a standard question that candidates are often asked to consider and as is often the case many misinterpret this: it requires that candidates suggest ways in which the *simulation* can be improved and as such requires that the assumptions underlying the model are reconsidered.

Mark Ranges and Award of Grades

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