



General Certificate of Education

Use of Mathematics 5351

UOM4/2 Applying Mathematics Paper 2

Report on the Examination

2007 examination - June series

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General

This question paper proved accessible to almost all candidates and it was pleasing to see some very good responses to all questions: in particular there appeared a greater level of confidence in dealing with exponential functions and logarithms than in the past. Candidates had more opportunity to gain credit for communication of their mathematics with up to 3 marks now being awarded for presenting work accurately using correct notation and up to 3 marks for presenting clear and logical mathematical arguments on this paper rather than on the paper for UoM4/1. Overall, the standard of presentation was good and this should continue to be encouraged.

Question 1

Part (a) of the question was answered well by almost all candidates, although many left their answers in hours and decimal parts of an hour rather than translating into hours and minutes. On this occasion this was tolerated as the question made no specific demands in this respect and it did not materially affect later parts of the question.

The majority of candidates were able to correctly plot a line to represent the journey for Route A in part (b) of this question. However, fewer candidates were able to effectively work backwards with Route B to ensure an arrival time of 4 pm, with many plotting lines to represent a journey starting at noon. A small number of candidates apparently did not have a ruler and consequently were not always able to clearly indicate when the change in speed occurred for Route B.

In part (c), very few candidates were able to substitute values into the given equation to determine the unknown parameters although a relatively small number were able to correctly identify that the parameter b represented speed, thus gaining credit for part (ii).

Question 2

Part (a) of the question was answered well by the majority of candidates, although a substantial number added complexity by equating the exponential to 0.5 and solving using natural logarithms rather than substituting directly into the given equation.

In part (b), a few candidates recognised that after an additional “half life” the mass would be halved and were able to give the correct answer after minimal working. It was pleasing to see candidates who were thoroughly familiar with the ideas of exponential decay.

Part (c) was answered well by the majority of candidates who presented clear and accurate sketch graphs.

In part (d), many candidates were able to identify the change to the gradient of the exponential decay and most of these were able to interpret this in terms of rate of decay, although some seemed to have difficulty in expressing this in words.

The responses to part (e) were often very pleasing, with many candidates being able to successfully solve the equation using natural logarithms.

In part (f), there were many correct interpretations of the situation, with some giving answers in terms of rate of decay and others in terms of the half lives of the two substances.

Question 3

Overall, this question was answered well by many candidates. A common error, although only made by a small minority of candidates, was to assume that the repayment remained fixed at the value of the first year (ie £900). With the majority of candidates appearing to be able to work well with recurrence relations, many went on to be able to gain credit for completing the table and graph on the answer sheet. A few lost marks for minor slips made here.

In the final part of the question, some candidates were unable to interpret the graph in terms of the real situation that it represented.

Question 4

Part (a) of the question was answered well by the vast majority of candidates. A small but significant number suggest that there are 9 random integers used in total: presumably this is because the highest value of a random integer given is 9.

In parts (b) and (c), many candidates gained full marks for either or both of the tables. However, there was a substantial amount of work to be followed through and many made a slip or two. A common error was to wrongly allocate a customer to a queue as they arrive. In particular, some candidates did not allocate customers to the lowest numbered cashier available although examples of how to proceed were available on the answer sheet using customers A – F.

Many candidates gave good advice using evidence from their simulations in part (d) of this question.

In part (e), many candidates suggested how to improve the simulations by making reference to the given assumptions. A substantial number suggested running the simulation for longer or more times or adding another cashier, which although it might improve the situation for customers, will not improve the simulation.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the [Results statistics](#) page of the AQA Website.