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Mathematics Advanced Level UOM4/2

(Specification UOM4/2)

Applying Mathematics Paper 2

Report on the Examination

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General

Because candidates were required to work with recurrence relations in UoM 4/1 there was no question in this component on this topic as in previous years therefore requiring candidates to work more substantially with a range of functions. Many appear to lack confidence in working algebraically and consequently found gaining marks more difficult than in previous years. Many candidates also seem to lack an awareness of the structure of functions such as the trigonometric function in question 3, and, therefore, what might be straightforward questions appear to cause considerable difficulty. When sketching graphs candidates continue to lose marks by not indicating the important features of the graph. In general trial and improvement methods should be discouraged: candidates should aim to demonstrate some algebraic facility when solving equations.

Question 1

The majority of candidates were successful in parts of this question, although many had difficulty with part (e) with its requirement to work algebraically. A lack of confidence of candidates in working algebraically was clear. When asked to 'show' a given result such as in part (b) the majority of candidates substituted the given values and demonstrated that the given result was true rather than work algebraically with the given expression to find the unknown. In part (d) many candidates used methods of trial and improvement: such methods can only gain credit if used to an appropriate degree of accuracy so that the correct answer is found.

Question 2

Overall, parts (a) and (b) of this question were not answered well. In sketching the required graph, candidates needed to make sure that the key features of the graph were clear: in this case that the axes were asymptotes, ensuring that the curve did not intersect or touch these. Although the required algebraic proof was relatively straightforward in part (b) (i) many candidates did not show their working clearly and were unable to gain credit, and a disappointingly low number were able to go on to correctly draw the straight line required in part (b) (ii). Part (c) of the question, which required candidates to find the logarithms of the data, was well done by many candidates, but a surprising number made mistakes in plotting the resulting points. Candidates should be encouraged to read the scales of graphs very carefully. In their answer to part (c) (iii), only a small number of candidates were able to use the intercept and gradient of the straight line graph to find the required parameters for the function.

Question 3

Candidates continue to have difficulty in working with trigonometric functions used to model situations. A surprisingly low number of candidates were able to find the maximum, minimum and mean values of the given expression as required in part (b). Again, in giving a sketch graph of the function in part (c) many candidates did not indicate the important features: in this case the mean value and maximum and minimum values (as found in part (b)) should have been clearly marked together with a clear indication of the period of the function. Many candidates found an appropriate answer to part (e) although they used a variety of numerical and graphical methods rather than working to solve the given expression. Although credit is given for totally correct answers found using 'alternative' methods, no partial credit can be gained if such methods are used.

Question 4

This is a standard simulation question for this component and as in previous series the majority of candidates provided good solutions to the majority of the question although some were quite careless in places. In part (a) it was noticeable that some candidates thought that there are 9 digits in the range 0 – 9. In parts (c) and (e), where candidates were required to complete the simulation tables, many worked accurately but some failed to recognise some of the winning runs of tokens. Fewer were able to adequately express how the addition of the purple token might prove less costly for the company in part (d). In part (g) a disappointingly low number of candidates were able to identify ways in which the simulation might be improved. Rather than going back to how the simulation is set up and consider how it might be made more sophisticated they considered how it might be made easier to get a winning run – this was not what the question was asking for.

Mark Ranges and Award of Grades

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