



General Certificate of Education

Use of Mathematics 5351

UOM4/1 Applying Mathematics Paper 1

Report on the Examination

2007 examination - June series

Further copies of this Report are available to download from the AQA Website: www.aqa.org.uk

Copyright © 2007 AQA and its licensors. All rights reserved.

COPYRIGHT

AQA retains the copyright on all its publications. However, registered centres for AQA are permitted to copy material from this booklet for their own internal use, with the following important exception: AQA cannot give permission to centres to photocopy any material that is acknowledged to a third party even for internal use within the centre.

Set and published by the Assessment and Qualifications Alliance.

The Assessment and Qualifications Alliance (AQA) is a company limited by guarantee registered in England and Wales (company number 3644723) and a registered charity (registered charity number 1073334). Registered address: AQA, Devas Street, Manchester M15 6EX
Dr Michael Cresswell Director General.

General

The majority of candidates again appeared well prepared and familiar with the pre-release data sheet. However, there was evidence that some candidates felt the need to unnecessarily use mathematics work beyond that in the article: for example, the conversion factor used to convert a speed in miles per hour to metres per second was given but a significant number of candidates attempted to do this using other methods that they had learnt and which were often much more complicated. Candidates should be advised that they should work closely with the supplied text.

A disappointing number of candidates appeared not to be able to sketch graphs even though they should have had access to a graphic calculator. There was also evidence that those who had calculators had them set in radian mode.

Question 1

A disappointing number of candidates did not appear to have familiarised themselves with the form of the sine wave as required by the pre-release article. The first question related to this general sine wave which was the first mathematics in the article. A number of candidates used the information given in the article and did not adapt this to answer the question asked.

In part (c), a disappointing number of candidates were unable to describe the difference between the cosine and sine wave although use of a graphic calculator would have quickly provided sufficient information.

Question 2

Throughout this question, substitution into the correct equations in the text of the pre-release article was required. A significant number of candidates managed to make arithmetic errors when working with the fractions that resulted, in some cases, inverting the results to avoid having a fraction as an answer. Some candidates misread the fact that the car was moving **towards** the observer although this was emboldened in the text.

Question 3

In part (a), a number of candidates did not use the conversion factor given in the article when answering this question and consequently involved themselves in substantial efforts that did not always give an acceptable answer.

When answering part (b)(i), many candidates did not appear to understand what was being asked of them when they had to find one value expressed as a fraction of another. Some candidates who had been unable to answer part (a) were able to successfully convert 45 mph to a speed in metres per second when answering this part of the question.

In part (b)(ii), some candidates who had failed to gain credit for their answers to the first sub-parts of this question were able to start from scratch and make progress with this final part of the question.

Question 4

Overall there were many successful attempts at this question which gained either partial or full credit. Having calculated the difference in frequency for a car travelling away from a speed camera at 40 mph and obtained a value greater than that given for the car in the text, a common error was to interpret this as meaning that the car was travelling at more than 40 mph when in fact the opposite is the case. Another common error was to work with a wave frequency of 24 GHz rather than the value of 35 GHz given in the question.

Question 5

Overall the response to this question was disappointing as, in essence, candidates were only required to substitute given values into a formula given on the pre-release sheet and then use the inverse cosine feature of a calculator to find an angle. A disappointing number of candidates were able to do this in the examination, many being unable to identify the correct formula in the text.

Question 6

Overall, part (a) was very poorly answered. This was particularly disappointing as not only should candidates be thoroughly familiar with the cosine function but they should also have access to a graphics calculator which would allow them to gain full credit for very little work.

Part (b) demonstrated that many candidates did not have a clear understanding of the cosine function and very few were able to correctly argue that since the value of cosine is always less than 1, the speed of a car as measured by a speed camera is always less than its actual speed.

Mark Ranges and Award of Grades

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