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Examiners' Report/ Principal Examiner Feedback

January 2010

GCE O Level

Mathematics Syllabus B (7361/02) Paper 2

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Mathematics Syllabus B

Specification 7361

Paper 2

Introduction

There was no general indication that the examination paper was too long, with many candidates attempting most of the questions. Overall, the standard of presentation and clarity of work was high.

Once again, it was pleasing to observe that many of the candidates have a good understanding of the basic techniques of arithmetic, algebra and two dimensional trigonometry and were able to apply them correctly. The major discriminating questions were subsets (Q1), the calculation of triangular areas (Q2), length conversions and standard form (Q4c), giving answers in the requested form (Q7b), vectors (Q8) and calculation of surface areas and angles in 3D objects (Q11c, Q11d and Q11e).

These will be discussed below.

Report on Individual Questions

Question 1

From the answers seen for part (a), it is clear that the majority of candidates did not know what a subset is and so this part was a major discriminator of the examination paper. Many candidates were able to do part (b).

Question 2

There were many disappointing attempts at this question with many candidates not realizing that in the triangular area formula, height and base have to be perpendicular. In part (a), many candidates failed to see the obvious approach to this and often these over complications lead to errors.

In part (b), a number of candidates treated AB as the base of and EB as the height of ΔABE. Also, many candidates gave the method and answer to part (a) in part (b).

Question 3

Generally a reasonable attempt was made at part (a). However, many candidates failed to take enough time to check which were the base angles in the isosceles triangle and, as always, there was often a lack of clarity over their reasons. In part (b), some candidates were not clear about which angle was required. Also, a significant number assumed that AC would bisect $\angle ECD$ or $\angle EAD$, or that a right angle appeared somewhere.

Question 4

There were many good attempts at parts (a) and (b). Common errors were using the wrong formula for volume of cylinder. The volume of a cone or the surface area of a cylinder were frequently seen. Quite a number tried to use cylinders with radius 9 or volume 20. Some found the radius of a cylinder with the same volume as the sphere and then divided by 20. In part (c), far too many failed to convert their answer to (b) to metres and then to put it in standard form.

Question 5

This question was generally well done. The majority knew what to do in parts (a) and (b) but there were a noticeable number in part (c) who decided to solve $v = 0$.

Question 6

This question divided the candidates into the majority who understood probability and thus did well and the noticeable minority who had no idea at all. A lot of the good candidates lost marks in part (a) by not understanding that they needed to put words in the final spaces and often used those spaces for the combined probabilities.

Question 7

Part (a) was generally well done. Part (b) was also generally well done but there were far too many candidates who failed to put their answer in the requested form, losing the A mark. Centres should advise their candidates that failing to put an answer in the requested form will result in the loss of mark(s). Part (c) showed that some candidates need to gain greater practice at squaring brackets as failing to do so usually resulted in the loss of many marks (usually up to 4 out of 6 in this part). A significant number of candidates were not aware that an equation in x^2 will generally have two solutions and not just one.

Question 8

It was disappointing to see that too many candidates still work with expressions which are clearly not vectors. Also, many candidates clearly did not understand that "simplifying" their vectors meant collecting coefficients. Part (a) was generally well done but a few candidates were not careful enough about order (i.e. getting $\mathbf{c} - \mathbf{a}$ instead of $\mathbf{a} - \mathbf{c}$). In part (b), a significant number of candidates showed that they did not understand ratios and used a divisor of $m + 1$ instead of m. Many candidates knew how to do part (c) but failed to simplify their answer, ditto in part (d). In part (e), many candidates knew which approach to take but others fell short of equating coefficients.

Question 9

Parts (a) and (b) were mostly well done. Many candidates were confused in part (c) with a small minority gaining full marks. Most candidates knew how to do part (d) from their answer to part (b), however, on a few occasions one vertex was wrong. The majority of candidates knew the answer to part (e). There were many correct answers to part (f), however, a lot of candidates took a lengthy route via simultaneous equations. Many candidates who used matrix multiplication had the matrices in the wrong order thus attaining at most the M mark only.

Question 10

Parts (a) and (b) were well done. A common error with the graph was to plot (4, -0.71) even though the correct value was in the table. The majority of candidates knew what to do in parts (c) and (d), however, there were a number in part (c) who did not carry on to read off the points of intersection. In part (e), many candidates gave y-coordinate of the minimum instead of the x-coordinate.

Question 11

Good solutions to this question were rare possibly due to the fact that this was the last question and also that many candidates still have difficulty with 3D trigonometry. Thus in part (c), many candidates took the diagram to be "flat" and wrongly subtracted $\angle ADE$ from 30^o to obtain $\angle ADG$, losing the three marks. A large number of candidates did not see the symmetry of the trapezia and assumed that $\angle EFC$ was a right angle. There was a lot of inaccuracies due to early rounding. Only the best candidates managed to collect full marks for parts (d) and (e).

Statistics

Overall Subject Grade Boundaries

Grade	Max. Mark	A	B	C	D	E	U
Overall subject grade boundaries	100	71	55	40	35	26	0

Paper 1

Grade	Max. Mark	A	B	C	D	E	U
Paper 1 grade boundaries	100	72	58	45	36	27	0

Paper 2

Grade	Max. Mark	A	B	C	D	E	U
Paper 2 grade boundaries	100	71	54	37	31	25	0

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