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Examiners' Report/
Principal Examiner Feedback

January 2016

Pearson Edexcel International GCSE
Mathematics B (4MB0)
Paper 02

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January 2016
Publications Code UG043275

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Introduction to Paper 2.

It was pleasing to observe that, overall, the standard of presentation and clarity of work was high.

As in previous examinations, it would be prudent for centres to encourage their students to answer the questions within the examination paper booklet and if students do continue their working onto another page, it is good practice to indicate that they *are* continuing the question on another page in the examination paper booklet or on a separate sheet of paper *and* indicate that page number and then clearly identify the question on that page.

The question paper did highlight the following problem areas, followed by their corresponding question numbers, which should receive special attention by centres:

- Carefully reading and understanding the demands of the questions (3(b), 5(b), 9(e), 10(d))
- Algebraic manipulation (1, 2, 6(c), 7)
- Matrix multiplication (9(b) and (d))
- Similar triangles (4(b))
- Use of ratios with vectors (6)
- Describing transformations (9(e))
- Ranges of values in graphs involving inequalities (11(d))

Report on individual questions

Question 1

Many students produced correct answers. There were, however, many careless sign errors and also a significant number of basic algebraic errors. A number of students failed to score any marks because of their failure to expand $(1-x)^2$ correctly and to combine the fractions.

Question 2

(a) Many correct inverses matrices were seen, however, it was clear that a number of students were not fully prepared and appeared to be confused by the manipulation of the elements of the original matrix.
(b) Few students used their inverse matrix to solve the equation. The majority preferred to use matrix multiplication to a produce a pair of simultaneous equations and, if the equations were correct, most went on to solve them correctly. Of those who did not manage to solve their equations correctly, this was mostly because of careless errors when attempting to balance the equations.

Question 3

(a) The majority of students successfully calculated this straightforward percentage calculation.

(b) Most students correctly calculated the new number of articles bought (M1) and the new cost price (M1) but a number then failed to proceed to the required answer by forgetting to divide by the new number of articles, thus losing two available marks, perhaps because of not reading the question carefully enough.

Question 4

Part (a) was usually well done apart from a few errors in applying the Cosine Rule.
Part (b) highlighted the fact that there are a number of students who still are not well versed with handing similar triangles and these usually became involved with a long trigonometrical approach, which only sometimes ended successfully.
Of those who seriously attempted part (c), many used the square of the scale factor correctly and produced the expected result. Others used a trigonometrical approach with varying degrees of success.

Question 5

Part (a) was a discriminator of the examination with only a handful of students answering both parts correctly.
In part (b), many students obtained a correct function of x but then failed to express it in the required format, probably because they had not read the question carefully enough, losing a mark.
Part (c) was well done with most obtaining the correct equation and solving it but then failing to reject the positive solution thus losing the final mark.

Question 6

Vector questions are normally a problem for many students however this one proved to be more popular.
Part (a) was generally well done. A common error was the incorrect interpretation of the ratio ($\frac{1}{5}$ instead of $\frac{1}{4}$), which then persisted throughout the rest of the question. Another common error was the use of $-$ **a** instead of **a** in (a)(iii).
Of those who answered (a) correctly, most went on to answer (b) correctly too. Occasionally in parts (a)(iii) and (b), sign errors were seen when simplifying the vectors.
It was pleasant to note in part (c) that many students were displaying an understanding of the methodology of equating coefficients with many of these arriving at the correct answers. A common error was concerned with the collection of the coefficients of **a** where a number of candidates missed out a term.

Question 7

This question was challenging to many students, particularly those across the lower grade ranges, who did not make any real attempt.
Only the most able students were able to obtain the required result for part (a) without having to resort to changes in signs.
Part (b) was also poorly attempted with many students using areas or using just the volume of the outer cylinder.

In part (c), those students who attempted the question knew what to do here but a significant number were then prevented from correctly arriving at the required result because of their incorrect expression from (b).
Part (d) was the most successful part of the question with many collecting all of the marks.

Question 8

Part (a) was usually well done but a few errors were seen.
Most students usually collected at least one mark in part (b)(i) with a few losing the accuracy mark because of their incorrect tree diagram in (a). In (ii), those candidates who used the complementary approach usually collected both marks but those who used the alternative approach usually forgot at least one of the seven probability triplets thus losing both marks. As in the alternative approach in (ii), the common error in (iii) was the failure to use all seven triplet probability triplets, usually resulting in the loss of 2 available marks.

Question 9

Many correct attempts were seen at parts (a) through to (d), with errors arising out of inaccurate matrix multiplication. In (c), the vertex C' was plotted below the *x*-axis by a surprising number of students.
Parts (e) and (f) discriminated, as in previous examinations, between the able and less able students. Many ignored the demand in (e) for a *single* transformation and gave several transformations, losing all the marks. Others gave a scale factor of +2 instead of the correct –2. Part (f) tended to be done well by those who were also successful in part (e).

Question 10

It was pleasing to a see a sizeable number of students making meaningful attempts at the trigonometrical parts of this question although quite a few students failed to give their final answer to (c) to the nearest degree as required.
Those students who were reasonably successful in parts (a) to (c) went on to collect most of the marks available in (d). However some thought, incorrectly, that $\angle ADE$ was 90^o. Unless explicitly stated in the question, it should be stressed to candidates that they should never assume values from diagrams in questions.

Question 11

Good attempts were seen at parts (a) and (b) with most students collecting all of the 6 marks available. A common plotting error seen in (b), was to plot the final point as (3, –12) instead of the given (3, 12).
Parts (d) and (e) were successful in differentiating the most able students. However, in (d), even the more able students showed a lack of understanding of the meaning of the symbol "<" , thinking it to be the same as "≤". Candidates who drew $y = -25$ in part (e) as required, usually collected both of the available marks.

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