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Examiners' Report/
Principal Examiner Feedback

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

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Introduction

It was pleasing to observe that, overall, the standard of presentation and clarity of work was high although there were a small number of exceptions.

As in previous examinations, it would be prudent for centres to encourage their candidates to answer the questions within the examination paper booklet and it is good practice, if they are continuing a question on a page which does not relate to the question that they are answering, they must 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 questions (5(a), 6(b), 7(c), 11(f))
- Matrix multiplication (3)
- Comparison of coefficient of vectors (7(d), (e))
- Conditional probabilities (9)

Report on individual questions

Question 1

In the main, this question was answered correctly but in part (c) a number of students had problems with reconciling the times given in London and Singapore and then using them to find the time for the plane journey.

Question 2

On the whole, this question was well answered. However, some students incorrectly thought in part (a) that n(A) was the value of the sum of the elements of set A whilst others gave the members of A as their answer.

Question 3

A popular question in which only a small number of students had problems with correctly multiplying the two matrices of the left hand side of the equation.

Question 4

Most students successfully factorised $2x^2 - x - 10$ in part (a) and then went on to collect the 3 marks available in (b). Invariably, those who did not attempt the factorisation then tried quotient differentiation in (b) and usually either their application of the differentiation formula was incorrect or their algebra let them down thus scoring nothing for the whole question.

Question 5

Part (a) was a discriminant of the paper in which a significant number of students showed that they had little idea of how to precisely describe a transformation. Of those that attempted this part, many did not read the instructions carefully enough and gave more than *one* transformation, losing all 3 marks. Fortunately, the matrix multiplication in (b) was usually performed correctly, followed by a correct drawing of the resultant triangle.

Question 6

It was pleasing to see many correct answers to part (a). Unfortunately, a significant number of the students who had a correct method for f^{-1} let themselves down by not leaving their answer in the form required by the question, thus losing the accuracy mark. Many students answered part (c) correctly.

Question 7

It was pleasing that this vector question proved to be more popular than ones in previous examinations with many students scoring well on parts (a) and (b). A number of students lost the accuracy mark for not simplifying their expression for $\overrightarrow{OP}$ as required in (c).
In (d), many students equated their versions of $\overrightarrow{OP}$ but then failed to correctly equate the coefficients of **b**, or in some cases did not attempt at all. Many of those who failed to successfully complete (d) then proceeded in (e) to use $m = n$, given in part (d), and usually gained at least one of the two marks available there, sometimes proceeding to collect the mark in (f).

Question 8

This question was well answered by the majority of students. Those who failed to give a fraction as their answer to (d) usually only gained the method mark in (f). However if any one of (b), (c) or (d) were wrong, most of the subsequent marks were lost.
Some of the students who answered (b) and (c) correctly and took note of (a), collected both marks in (g).

Question 9

Most students attempted this question with varying degrees of success. Part (a) was usually well done. Nearly all the students got the first branch $\left(\frac{4}{5}, \frac{1}{5}\right)$ correct, but a significant number of these were confused about the 2nd and 3rd branch, usually resulting in the loss of most of the marks for parts (b) and (c). However, many accurate answers to (b) and (c) were seen. Part (d) proved to be a discriminator of this paper, with only the more able students making a substantial attempt at this part.

Question 10

It pleasing to see many students scoring full or nearly full marks on this question. A number of students did not realise that the simplest method for part (a) involved using the interesting chords theorem. Students who failed to realise this usually scored nothing, whilst others performed many correct trigonometrical calculations before arriving at the answer – but still only scoring 3 marks if they were correct. A few noticed that $\triangle PAD$ and $\triangle PCB$ were similar triangles and then usually found correctly that $AB =$ 13.5 cm. Most attempts at parts (b) and (c) were correct.
Intriguingly, many students failed to provide a reason for part (d) as requested. Others who did not use circular geometry to find $\angle PAD$, had to first find AD (3.5 cm) and use the Cosine Rule for $\angle PAD$, usually gaining M1 A1.
The question gave enough information for students to correctly calculate the area of $ABCD$ in part (e) without the need to answer parts (a), (c) and (d) and many students successfully took advantage of this, gaining at least 7 marks if (c) was successfully attempted too.

Question 11

On the whole, this was a popular question despite being the last one of the paper. Many students collected most of the marks for parts (a), (b) and (c), although there were some instances of students arriving at the given expressions from incorrect expressions or erroneous algebra. Curiously, a few students did not realise that part (d) required calculus to find the minimum and instead thought that the required value of x would result from solving $A = 0$, obviously gaining no marks.
Parts (e) and (f) were usually well done even by students who either had not attempted (a) to (d) or got them wrong. However in (f), a number of students failed to plot their value of the minimum of A in their graph, probably because they had not read the demand carefully enough, thus needlessly losing a mark.

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