Pearson

Examiners' Report

Principal Examiner Feedback

Summer 2017

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

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Introduction

It was pleasing to observe that, overall, the clarity of work was high. However, there were some candidates whose work was poorly presented and in some cases illegible and was thus difficult to follow.

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

- Geometric reasons ((3c))
- Venn diagrams. Conditional probability. ((5))
- Number of entities in a subinterval (6d)
- Presentation of all steps in a method leading to a final answer for a "show that" question (7c)
- Carefully reading of the demand of a question (8c)
- Manipulating algebraic indices (10a)
- Correct order of multiplication of two matrices (11d & e)

Report on individual questions

Question 1

This question proved to be a popular question with many students gaining full marks. Part (b)(i) proved problematic to some, with a common error being $\left(\frac{5}{10}\times £1800\right)\times 1.2$ (="\$"1125) in which the conversion of pounds to euros was omitted (M0 A0).

Question 2

The first two method marks were collected by many candidates, however, a number of these lost the accuracy mark usually due to a sign error. Most candidates then continued and attempted to solve their quadratic, usually gaining the two method marks. A common erroneous final answer of 6.13, which arose from internal rounding, was occasionally seen. A significant number of candidates gave both solutions of the quadratic as their final answer (A0), however, many candidates collected full marks for this question.

Question 3

The majority of candidates collected full marks for parts (a) and (b) and the three marks for the angle values in (c), the reasons being enigmatic to many. Common incorrect reasons for (c)(i) were "parallel lines" or "alternate angles". Numerous candidates did collect the reason mark in (c)(iii), not for correct logic, but presumably because "angle sum in a triangle" (or equivalent) was used for several angles. Surprisingly, many candidates omitted to attempt part (d), of those that did, many incorrectly thought that $\angle AOE = 180^o + 44^o = 220^o$ and not $\angle AOE = 180^o - 44^o = 136^o$.

Question 4

Parts (a), (b) and (c) proved popular with many candidates. Part (d) proved to be problematic to some who appeared to be confused by the rectangular sides of the prism, giving their answer as $3 \times 9 \times "h"$. A sizeable proportion of candidates collected full marks.

Question 5

If the candidate completed the Venn diagram correctly, then usually full marks were gained for parts (b) and (c). In (b), a common error was to forget to involve 7 in their method statement, leading to an incorrect answer of $x = 23$ (A0) which lead to a negative value for one of the sectors (M0 A0) in (c). Most candidates, though, were confused by the conditional probability required by part (d) with many incorrect denominators of 100 being seen in answers to (d). Of those who did not correctly complete their Venn diagram, some collected no marks from the latter part of question, whilst others collected the method marks in (b) and (c).

Question 6

Many candidates made a solid attempt at part (a), usually collecting at least three of the four marks. It pleasing to see that most candidates can now draw histograms with the result that a majority of candidates collected the three marks available in part (b). In part (c), the abler students realised that the contribution of cars from the $20 < x \le 26$ interval was 5 cars (M1) and so proceeded to find the correct answer (11 cars, A1).

Question 7

Parts (a) and (b) were successfully answered by most students, however, some of the weaker students had problems in changing their method from the numerical one required in (b) to the algebraic one required in (c), picking up possibly one of the method marks. Other students were let down by their algebra and were not able to gain the final A1 mark of (c) for a correct conclusion. It should to stressed to candidates that all steps must be shown in a method leading to a final answer for a “show that” question, so those failing to show the expansion of their brackets lost the final mark (A0). Part (d) was correctly answered by many candidates. Some candidates decided that the solution of the quadratic was required and gained no marks for (d).

Question 8

Parts (a) and (b) were usually done well although there are a number of students who would benefit from enhancing their ability at sketching curves. Such students, as in past examinations, unnecessarily lost valuable marks. In (c), a sizeable number of candidates did not realise that they had to rearrange the given cubic into a form including y and something else thus losing the method mark and thus the two accuracy marks. Poor curve plotting was prevalent with those students choosing to plot $y = = -2x^3 + 3x + 1$ with the resulting poor accuracy causing in one or both of the accuracy marks being lost. A number of candidates simply solved the given equation on their calculator and gave the three values, ignoring the instruction to 'Use your curve' and lost all of the marks for (c). Sign errors were evident in the first stage of the answer to (d) resulting in the loss of the first method mark and the final accuracy mark.

Question 9

Many candidates gained most of the marks available in part (a), (b) and (c) because the marks in (b) and (c) were follow through marks dependent on their answers in (a). Numerous candidates collected the first method mark in (d) for equating their versions of $\overrightarrow{MS}$ but then went awry because they were not sure of how to go about equating the components of **a** and **b** thus losing most of the following marks Others believed that vectors can be divided, gaining no marks. Part (e) tended to be answered by the abler students with part (i) being the most successful subpart.

Question 10

It was pleasing to find numerous candidates collecting full marks for this question. The abler students rewrote 6, 9 and 12 as products of 2 and 3 and proceeded to obtain the required quadratic for n. Some of the weaker students only manged to find that $\left(2^{3x}\right)^{x-2} = 2^{3x^2-6x}$, gaining one method mark and then stopped whilst others had no idea of what to do. Most students realised in part (b) that 32 = 2^5 and so equated the given quadratic for n to 5 and solved the resultant quadratic, others who did not know this managed to at least collect the independent method mark for solving a quadratic, provided they had a quadratic to solve.

Question 11

Parts (a) and (b) were usually correctly answered. Some candidates, though, thought that the rotation was 90° *anti*clockwise, losing one mark. Many candidates could not remember the matrix required for (c), whilst others managed to successfully calculate it by using their coordinates of the triangles P and Q but still only gained the one mark available even though they had a lot of work to do. Part (d) was well answered. Many candidates did not realise that part (e) required the given transformation matrix **M** to be multiplied by their answer to part (c), losing all of the marks, or attempted to multiply these matrices but in the wrong order, losing the first mark but gaining the second if their multiplication of their matrices was accurate (as they were multiplying two 2×2 matrices). Other students, as in part (c), calculated the required matrix from the coordinates of matrices P and R. Although this approach was correct, it did involve more work, and so it was pleasing to observe that most of the students attempting this approach were successful and collected all three marks.

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