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Examiners' Report
Principal Examiner Feedback

January 2020

Pearson Edexcel International GCSE
In Mathematics B (4MB1) Paper 1R

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January 2020
Publication Code 4MB1_01R_2001_ER

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Paper 01R

Introduction to Paper 01R

Students were generally prepared for this paper and there were some excellent responses.

To enhance performance in future series, centres should focus their student's attention on the following topics:

• Minutes as a fraction of hours or other time scales

• Questions that involve the demand to show all working

• Standard form

• Combined Mean

• Unstructured questions

• Sets and Venn diagrams

• Learning angle reasons

•In general, students should be encouraged to identify the number of marks available for each part of a question and allocate a proportionate amount of time to each part of the question. In addition, students should also be advised to read the demands of the question very carefully before attempting to answer. It should be pointed out that the methods identified within this report and on the mark scheme may not be the only legitimate methods for correctly solving the questions. Alternative methods, whilst not explicitly identified, earn the equivalent marks. Some students use methods which are beyond the scope of the syllabus and, where used correctly, the corresponding marks are given.

Question 1

On the whole, more students struggled with this question than expected. While we saw a good number of full marks, some showed use of percentages and also use of hours in a day twice eg $24 \times \frac{7.5}{24 \times 60}$ and others gained just one mark for an answer not in simplest form.

Question 2

The majority of students were able to get full marks for this question on sequences, but a few lost marks for equating the given expression to 1 and to 3 rather than substituting 1 and 3 into the expression.

Question 3

We saw a good number of full marks gained for this question. The most common way to lose marks was to say that, $x = \frac{5}{6}$, the reciprocal of the correct answer.

Question 4

We saw many correct answers to this question which asked students to factorise completely an expression. Those not able to gain marks, missed the fact that each pair of terms had a common factor.

Question 5

Some students struggled with this question about the maximum value and the range of a function. The problem was that students failed to understand that a square number is always greater than or equal to zero. It was pleasing to see that students showing an understanding of the range of a function were generally able to give the answer in a correct form.

Question 6

This question on standard form was deliberately chosen so that it could not be calculated on the calculator and so needed knowledge of indices and standard form. We saw a fair number of correct responses but many students gained just 1 mark for a number not in standard form; these answers were generally 0.125×10^{-148} or $\frac{1}{8}\times10^{-148}$

Question 7

Many students were able to correctly differentiate *y* correctly. Those that did not gain full marks often gained 1 mark for a correctly differentiated term. One problem was that a small number of students decided to differentiate the equation as a quotient and got into difficulties. Other problems were that some students found $\frac{\mathrm{d}^2y}{\mathrm{d}x^2}$ rather than $\frac{\mathrm{d}y}{\mathrm{d}x}$

Question 8

We saw mostly correct answers to this question on line and rotational symmetry.

Question 9

This was the first of the questions worth 3 marks and was generally very well done by students. Some students added an additional line of integer values that would be included in the range of values for the solution of the inequality. We did not penalise this as it was extra information not required; however, students would be wise not to spend time on doing additional work not requested as they are giving themselves a time penalty.

Question 10

It was disappointing that some students failed to understand the process needed to find the combined mean of all the large and small plates. We saw many students gaining 1 mark for the

total weight of the large plates or the total weight of the small plates, and then no more marks. In addition, many students tried to create incorrect fractions from the information given.

Question 11

It was very pleasing to see the vast majority of students showing their working and giving the correct LCM and HCF of the three numbers, thus gaining full marks. A small number got the LCM and HCF mixed up and were able to gain a Special Case 2 marks. Anyone not showing working gained no marks as we are aware that the question can be worked out by using the calculator.

Question 12

We saw many correct answers to this probability question. Those not gaining full marks were often able to gain a mark for finding an estimate of the number of trains arriving late or on time and stopping there – this left one wondering if the demand of the question had been read carefully. Just giving the probability of arriving early was another answer that was seen fairly frequently.

Question 13

We saw many full marks for giving the three inequalities to define the shaded region. A small number of students rearranged the given equations and gave correct answers, but some rearranged incorrectly and so their extra work cost them valuable marks. The suggestion would be not to rearrange equations in a question such as this, unless directed to do so as it causes extra work and hence a time penalty as well as giving the potential to make a mistake in the rearranging.

Question 14

For those that knew what was meant by a subset of the set that have 2 elements this was a very straightforward question and they were easily able to pick up the 3 marks. We did, however, see many students who had absolutely no idea of what to do and saw lists of numbers and words that made no real sense in the context of the question.

Question 15

We saw a good number of correctly simplified expressions that gained full marks. However, there were several students who failed to realise that writing the fractions over a common denominator would be needed and hence they only gained 1 mark. Some students gained 2 marks for a correct but unsimplified answer such as $\frac{-3x^2+15x}{6}$ which was just one step away from full marks – if students are asked to 'simplify fully' they should look carefully at the answer they are giving.

Question 16

It was a shame that many students found the missing dimension for the rectangle and then stopped. The diagonal was asked for and it was an easy Pythagoras step to find this. Again, students must be persuaded to read the question carefully – and check they have done everything required of them.

Question 17

We saw some correct answers to this question on area of a shape that could be seen as 2 triangles or a trapezium. We saw about equal numbers of both approaches. Unfortunately many students found *AD* or *DC* and showed no further working. Others who continued had prematurely rounded and this meant they failed to achieve the final accuracy mark.

Question 18

This was one of the question that requested students to 'show your working clearly' and without this no marks could be awarded as we know it is very simply done on the calculator. Some students who did not know what to do, clearly tried the calculator approach. We were pleased that many students did indeed show all their working in a logical and thorough way and were able to benefit from full marks.

Question 19

On the whole, students found this question challenging and many were only able to achieve the first method mark for a correct start to the problem.

Question 20

Students made a very good attempt at multiplying the matrices with many gaining full marks. Small slips cost some students a mark but there were few who gained no marks at all. It was pleasing to see so many students able to square a matrix correctly as in the past this has been a stumbling block.

Question 21

For full marks on this histogram question students needed to complete the 3 bars and the scale as this is what we saw as a complete histogram. The biggest omission was giving no scale but the correct 3 bars and this gained 2 marks out of 3. One correct bar – usually the 3rd one was also seen frequently and this gained 1 mark. Quite a well attempted question on the whole with a good number understanding that area is in proportion to the frequency in a histogram.

Question 22

Sets and Venn diagrams was a weakness on this paper and many students gained poor marks on this question, not understanding the terminology at all. There were those who were able to answer the number in the 2 sets requested but had no idea what these numbers referred to in the context of the question. Many students tried to describe the sets in terms of set notation. Many failed to understand that *C* meant farmers who kept cattle and thought it was just cattle, etc.

Question 23

This question was a multi-stage one and some students stopped at the first stage where they thought that gaining the constant term in the equation for the distance was all that was required. Those who understood the need to continue often gained full marks.

Question 24

Part (a) was the most poorly done part of this question as it involved an area scale factor and therefore was set at a higher grade than part (b) which involved a linear scale factor. In part (a) many students dealt with the area as if it were a linear measurement. For part (b) we often saw the correct answer but a few students fell down because they thought there were 100 cm or 1000 cm in a km.

Question 25

A pleasing number of students were able to rearrange the formula to give x in terms of y and w correctly. Those who were more unsure tended to gain a method mark for squaring both sides and sometimes also for correctly removing the denominator. Expanding and rearranging often caused problems for weaker students.

Question 26

Many students were able to give the correct angles to gain them the method and accuracy marks. Students not gaining full marks were often able to gain a method mark for showing in their working or on the diagram that angle $ACD = 30°$ However, students sitting this paper were generally very weak at giving reasons and many failed to even attempt to give reasons.

Question 27

We saw a lack of working for this question and usually just lines or markings on the diagram. 2 marks was by far the most frequently awarded mark for showing 7 seconds for the first stage of the journey. This was generally shown on the graph. The time for the deceleration of the cyclist was more often incorrect with a mixture of values and some showing a line that went off the graph completely; we would not ask students to show a line on the graph that could not be shown on the graph!

Question 28

For part (a) many students used an area formula and it must be pointed out to students to read very carefully the demand of a question. Some were able to gain 1 mark, often for pi × r but full marks for this part were rarely seen.
Part (b) was found to be most challenging and many students failed to realise that length $FH = r$ which hindered their progress. The question was set at the highest grade, so it was expected that many students would find it harder to access.

Question 29

Part (a) was well answered for this level of question with many students showing a complete understanding of what was required. Part (b) was not answered so well with many students using the slant height rather than the height of the pyramid to find the volume. However, a mark could and was often picked up for finding the area of triangle ABC.

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