Examiners' Report
Principal Examiner Feedback

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Pearson Edexcel International GCSE
In Mathematics (4MB1)
Paper 02R

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International GCSE Mathematics – 4MB1

Principal Examiner Feedback – 4MB1 02R

Introduction

Students found this a challenging paper and in many cases not reading the question carefully cost marks.

The students sitting this paper had strengths in algebra and question 3, 5 and 9 were done much better than others.

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

- Showing more clear working

- Work with set notation and Venn diagrams

- Work on Upper and Lower bounds

- Reading questions carefully and ensuring they answer what is required of them

- Knowing the difference between direct percentages and reverse percentages.

Report on Individual Questions

Question 1

(a) This question was reasonably well done but there were a good number of students who misunderstood the information given and instead of showing they understood that $23 622 represented 93% of the manufacturer's price, instead found 7% of $23 622 and added it on.

(b) This part was done reasonably well, the only mistakes being students finding the percentage loss as a percentage of the selling price rather than the amount he paid for it.

(c) This part was very poorly done with few students gaining full marks. A few students were able to pick up a method mark for showing an expression for the cost of the fuel and for showing an equation with just one missing component. The missing component was always the loss in value.

Question 2

(a) The vast majority of students were able to find the HCF of 75, 90 and 120

Those who found the LCM often picked up a method mark for showing the numbers written as a product of their prime factors.

A few students gave 5 as the HCF, this being the highest value when the numbers were written as a product of prime factors.

(b) This question was well answered with the majority giving the correct answer of 09 46

A few students misread the question and their working suggested they thought both alarms sounded at 09 30; these students were generally able to pick up a method mark for showing '24' as the LCM of 8 and 12

Question 3

Overall this question on inequalities was done well.

(a) Most students gave a correct answer here and for those that didn't they often picked up a method mark for showing 8a = −2; their error was then to say that a = −4 rather than −0.25

(b) Most students were able to give the inequality shown by the number line. A few, however, misinterpreted the arrow and thought that w was greater than −3

(c) This question was met by a pleasing response. However there were some students who got their x's and y's mixed up putting $y > −1$ and $x > 0$ rather than $x > −1$ and $y > 0$

It was pleasing to see so many students give the correct equation and then inequality for the diagonal line.

Question 4

This question was one of the most poorly done on the paper. Sets and Venn diagrams is an area that needs more improvement. Students were generally unable to fill in the Venn diagram correctly and this impacted the whole question. We allowed follow through marks for parts (b), (c) and (d) but student's poor knowledge of set notation meant that few were able to benefit from these marks.

Question 5

This question was well done, with algebra being a definite strength of this cohort.

(a) Most were able to factorise this quadratic correctly. A few thought that it was a quadratic equation and went on to solve it – in this instance we ignored the subsequent working, but this is not always the case so students must know when to factorise and when to solve.

(b) This was quite well done but there was the inevitable mistake made when the bracket needed multiplying out and multiplying minus 2 by minus 5 often did not result in positive ten. We allowed one sign error so students were able to pick up most of the marks; however, it is an area that students should work on.

Question 6

The transformation question was well answered with several students gaining full marks or only losing one or two marks.

(a) If students have to draw the initial triangle they should spend time doing this as this can affect the whole question if done incorrectly. Luckily most showed the correct triangle.

(b) Most students were able to multiply the coordinates of triangle A by matrix M to obtain the triangle B. Few errors were seen.

(c) Most students were able to reflect triangle B in the line y = 0 but a minority reflected it in x = 0

(d) The matrix N was found by the majority of students which was pleasing. Those who did not get it completely correct were often able to pick up a method mark for 2 correct entries in the matrix.

(e) The majority of students were able to correctly rotate triangle C 180° about the correct point to obtain triangle D. Those that did not pick up full marks were generally able to pick up M1 for a correct rotation of C about any point.

(f) Describing the enlargement was the least well done part of this question. Most students knew the transformation was an enlargement, but a few lost out on the mark for this transformation because they also thought that a translation was involved – the clue was in the question where it said **single** transformation. Many students were able to give the correct centre, but the scale factor was often given as 2 rather than ½

Question 7

This question was met by a mixed response and it is clear that some students find the statistics element of the course more challenging than the other parts.

(a) Many correct answers for the median class interval were seen. If the answer was incorrect it was often the 8 – 10 interval which is the middle of the intervals if you take out t > 30 which had a fequecy of 0

(b) We saw many good responses to finding an estimate to the mean length of time the birds spent on the bird table. If students did not gain full marks they often gained a method mark for multiplying the frequency by some value in the range and then another for dividing by 28.

(c) Many students were unable to correctly complete the histogram showing they did not see the connection between area and frequency.

(d) for the proportion of birds that spent longer than 15 seconds on the bird table we were looking for a fraction, decimal or percentage. However, many students just gave us the nuber of birds that spent longer than 15 minutes on the table and this was insufficient to gain the mark.

Question 8

The majority of students showed a poor understanding of upper and lower bounds and few were able to gain any marks on this question. Students often used the numbers as they were, ignoring the use of upper and lower bounds or for the distances they understood 5 km to the nearest 20 m to mean that the distance was 5.020 km and similarly 10 km to the nearest 200 m as meaning that the distance was 10.2 km.

Question 9

(a) Most students did well on this question and were able to show working to gain the results as requested. The equation for the perimeter was, surprisingly, done less well than the equation for the area.

(b) This part was generally done well, even by students not able to get the results needed for part (a). The mistakes we saw were often with 4y² and not realising this was (2y)². In fact the most successful students always found the value of one y or one x.

Some students missed out on the final accuracy mark for this question as they gave both the positive and negative results.

This question was one in which a lack of working cost some students marks. In particular, showing the solution of an incorrect quadratic equation was worthy of a mark – but only if the student showed us their working.

Question 10

Although this question was set at a higher grade than quite a lot of the paper, it is one in which students were generally able to gain a good number of marks.

(a) Most students were able to show us, by use of the factor theorem, thtat $(3x - 1)$ is a factor of $f(x)$

Of those who didn't, a small number showed by dividing, but this gained no marks as the question was targeting knowledge of the factor theorem as asked.

(b) Most students were able to correctly solve the equation $f(x) = 0$

(c)(i) Again, most students were able to find the gradient of the curve at P

(c)(ii) This part of the question was hard for students and there was not such a good success rate as on the rest of the question. However, a pleasing number were able to gain full marks.

Question 11

(a) This part was well done and most students were able to gain the full 3 marks

(b) Most students gained the mark for the volume of a cylinder.

(c) This part of the question was very challenging and many students showed little attempt. A few found the volume of the hemisphere and gained a mark. It was unfortunate that a small minority forgot to divide the area of a sphere by 2. Some students thought that the radius of the small cone would be the same as the radius of the large cone which of course was a fundamental error.

Some students showed good working and a correct answer and this was mainly achieved by using the similarity of the volume of the larger cone with the smaller cone that was not filled with sand.

Question 12

This question on vectors had a pleasing response with several students gaining full marks or almost full marks.

(a) The most common mistake in this part was to have misunderstood the meaning of the ratio explaining the position of *E* and instead of understanding *OE* : *OB* = 1 : 2 meant that *E* was the midpoint of *OB*, some thought it was 1/3 of *OB*. A very small number worked out *EF* rather than *FE*.

(b) Many students were able to show that *F*, *E* and *C* are not collinear. A few students were working with *AB* or *BC* and comparing it to *FE*, misunderstanding what was required here. A few students were unable to explain why the vectors they had found for *FE* and *FC* or *EC* showed the 3 points were not collinear.

(c) This part had some very good responses but some students did not realise the need to use coefficients and find the value of them in order to find *OG* in terms of **a** and **b**. A number of responses for this part were also left blank, suggesting a lack of understanding as to what was needed.