Examiners' Report
Principal Examiner Feedback

Summer 2018

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

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Introduction to Paper 02R

It was pleasing to see that the majority of students were well prepared for this examination and for the topics new to the specification. Students were also well prepared for the work at Grade 9 and even if they couldn't complete all parts were positive in their approach and often picked up some marks on these more challenging questions.
The question paper did highlight some common problem areas which should receive special attention by Centres:

- Reverse percentages (Q10e)
- Venn diagrams (Q7)
- Probability (Q9b)
- Working accurately and not prematurely rounding
- Reading questions carefully
- Recalling and using the correct formulae for the situation

Report on individual questions

Question 1

The vast majority of students made a good start to the paper by getting this question fully correct.
Incorrect responses included multiplying the wrong perimeter by 3, only using one length and one width for the perimeter of the rectangle, and using equations for area. These incorrect methods in some cases led to a negative value for x but this didn't seem to worry students.
A few students, having found the correct value for x, continued to check their work by substituting the value of x into the perimeter equation; clearly if there is sufficient time this is a good idea.

Question 2

This question was very well answered by most of the students sitting this paper.
A few got one incorrect value in the table (2, 4) instead of (2, −4) and then plotted this incorrectly with the resulting graph only intersecting the drawn curve once, so that there was only one x value to read off. Most students were able to correctly answer part (c) and give the correct solutions, however, a few missed out on the final accuracy mark as they wrote the values as coordinates; students must note that if an equation is in x, the solutions of this equation can only be for x.

Question 3

This question was very well answered by students, many getting full marks. Those that did not do well often used an incorrect formula for the volume of a cylinder.
The common errors were to write the time of 4.8 hours incorrectly and we saw all of the following, rather than 4 hours 48 minutes: 5 hours, 4 hours 80 minutes, 4 hours 8 minutes and 5 hours 20 minutes. Some students need to remember that there are 60 minutes in an hour and therefore decimal values of an hour are not minutes.
In part (b) some students divided the volume by 3 (hours) rather than 180 (minutes) even though the rate for R was clearly stated as litres per minute.

Question 4

The majority of students were able to answer parts (a), (b) and (c) correctly with a few errors in part (a) telling us that -3 rather than 3 needed to be excluded from the domain of g.
Part (d) was a very challenging part of the question and at the highest grade for the paper so it was pleasing to see a good number answer it correctly. Students failing to gain marks for this part generally solved the quadratic equation $h(x) = 0$ and gave the 2 values they gained as the inverse.

Question 5

Most students were able to gain the correct result for part (a) although a few did not expand the bracket correctly and a few wrote the inequality sign the wrong way round.
Part (b), simultaneous equations involving a quadratic is a new topic to the specification so it was pleasing to see such a good response from so many students; full marks was not uncommon. We saw many good results with the common mistakes to make $y = 3x - 5$ or $y = 5 - 3x$ rather than $y = 3x + 5$; care needs to be taken here as this stage is key to ultimate success on the question. Some forgot that squaring a 2 term expression meant that you do not just square the first and last terms. At the end, the final mark was for correct values for x and y clearly paired; a few students forgot to find the y values and several forgot to pair them clearly.
Many students for part (c) did not seem to realise that -1.5 was less than -1.25 and gave the answer as -1, but we did see a good number of correct answers.

Question 6

Several candidates gained full marks on this question, showing careful working that was easy to follow. Some students were able to get as far as finding the x coordinates of the turning points or even the full coordinates but were unable to get any further. Some students made 'silly' mistakes such as dividing the original values of $\mathrm{d}y/\mathrm{d}x$ by 6 but calculating one term incorrectly. Follow through marks were of great benefit to number of students on this question.

Question 7

Students seemed well prepared for this question with many good solutions seen. A few students did not realise they had to start in the middle intersecting part of the Venn diagram and subtract values to get values for the intersection of 2 sets and for the sets alone and so gave the numbers as they were in the list on the Venn diagram. A number of students failed to put the '8' outside the circles even though it was stated at the end of the list. Most students were able to find the total number of students in Year 9 with a method mark being available to a student with the incorrect values in the Venn diagram. It was pleasing to see so many students gaining the mark for the number of elements in a set given as set notation. The probability was also often correct and if not, many students picked up one mark for the denominator or numerator correct.

Question 8

This was a straightforward 9 marks for the majority of students who were well prepared for a transformation question.
There were some students who were able to correctly calculate the matrices for the coordinates of the transformed shapes but not able to plot all the coordinates correctly. Some students produced final shapes that were clearly not the image of triangle *A* under a single transformation; if this is the case, then the advice would be to look back at the matrices/plotting to see where a mistake has been made. Invariably any mistakes were with calculating with negative and positive integers or being careless with the plotting of coordinates where one or both were negative.

Question 9

(a) This part was almost always correct, with any incorrect responses able to generally gain 2 method marks for at least 3 correct products and dividing the sum of products by 100. The problem for the students who lost marks was the differing widths of the class intervals and not paying enough attention to the consequential mid-interval values.
(bi) This was generally correct but a few lost the marks as they forgot that when you pick 2 people from the 100, on the second pick, you only have 99 to choose from.
(bii) Some students forgot that there were two products to include for this part and were only able to gain one method mark for a correct product. A few lost marks for using replacement probability as in part (bi) but were able to pick up one method mark if their method was a full method (ie including the 2 products) but for replacement probability.

Question 10

(a) This part, requiring the students to calculate 28% of 250 was calculated correctly by all but a very small handful.
(b) Again, this was almost always correct but for the ratio of lemon cakes to chocolate cakes being in the ratio 4 : 5, a few thought this meant 4/5 were lemon rather than 4/9 and a few found 4/9 of 250 and forgot that some cakes had also been accounted for as chocolate cakes.
(c) All candidates were able to show a correct method to find the total amount of icing sugar needed, but a few thought there were 100 grams in a kilogram and so lost the accuracy mark.
(d) This was almost always correct and if not correct, a correct method was seen and method marks awarded.
(e) Students, on the whole, found this reverse percentage part of the question very difficult and in many cases showed an equation such as $944.80 - c = 1.6c$ or 944.80×0.4, missing the point that the equation needed to be $944.80 - c = 0.6c$ or equivalent.

Question 11

This question was probably the hardest on the paper and set at grade 9 so it was very pleasing to see almost every student have a go and pick up at least some marks. The most common mistake across the question was to think that $ON = KO$ and for this reason many students who were able to do one part of the question correctly did not get the other part correct as they either doubled NO or halved KN, depending on where they started. Another incorrect assumption was that the side length was equal to the centre to each vertex of the pentagon, such as is the case with a regular hexagon. Some very thorough, correct step-by-step solutions were seen and these were well deserving of the marks.

Question 12

This question was also very challenging so it was pleasing to see the majority attempting it. Many students could not form an equation in x only for part (a) but they could begin to answer part (b) by using the cosine rule to find an angle and then were able to find the area of the triangle, gaining 3 marks. It was good to see students show such a positive attitude, who, even though they could not do part (a) still continued to try part (b) where they were generally able to gain some success.
Common mistakes on this question were to think that the diameter of the circle was 8 cm, the same as length AC or to calculate PQ, and use this as the diameter.

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