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Principal Examiner Feedback

November 2015

Pearson Edexcel GCSE
In Mathematics B (2MB01)
Higher (Non-Calculator) Unit 2

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GCSE Mathematics B (2MB01)
Principal Examiner Feedback – Higher Paper Unit 2

Introduction

It was encouraging to note that students showed their working on the starred (QWC) questions.

The standard of basic arithmetic was often poor and marks were lost when students could not perform simple calculations. This was evident on questions 1, 5 and 7. For example, a common incorrect calculation on question 5 was 8 × 8.50 = 64.4

Many students did not read the question thoroughly and therefore did not provide the required answer. For example in question 10 many did not give their answer as a mixed number and in question 14 they gave their answer as an expression rather than a formula.

Report on Individual Questions

Question 1

This question proved to be a good starter question with many students scoring at least 2 of the 3 available marks. Some students just multiplied or divided the amount of each ingredient by 2 but mostly the errors were arithmetic.

Question 2

Some students did not understand that the perimeter of the trapezium did not include the two lines inside the trapezium with 8 × 7 = 56 being a common incorrect response. Few tried to generate at least 3 terms of the sequence or wrote sequence 4, 5, 6 with most students failing to score any marks.

Question 3

Many students struggled to answer this question with many attempting to find the product of 21, 15 and 35. The best responses tended to show on the diagram that a possible length, width and height was 3, 5 and 7. Some students did score a units mark for cm^3 even if they had little idea of a correct method to work out the volume. However, many did not put any units with their answer.

Question 4

There were many fully correct graphs drawn. Most students used a table of values to achieve this. Some students struggled to find the correct y value when x was negative. A few plotted the correct points but failed to join these points with a line.

Question 5

It was good to see lots of clear working to answer this question. Most successful students correctly used the first method given on the mark scheme with a few of these students not rounding the 7.5 to 8 before multiplying by 8.5. Some of the students who started this method and got 10 and 15 then demonstrated they did not understand what they were doing as they then went on to do 15 + 10 = 25, 25 ÷ 20 = 2 boxes getting the incorrect answer of £17.

Some students scored their first mark for 3 × 2.5 or 20 × 25. The students that used this method were then not able to convert 7.5 m^2 to cm^2 or 500 cm^2 to m^2.

Question 6

Most students did not score any marks on this question. Those that could generate at least 3 terms for sequence A failed to do the same for sequence B often because they wrote $2 - 10 = -8$, $4 - 10 = -6$, $6 - 10 = -4$ instead of $10 - 2 = 8$, $10 - 4 = 6$ and $10 - 6 = 4$. The few that did generate both sequences correctly and identified that Sally was correct because 4 was in both sequences then did not go on to say that one sequence was increasing and the other was decreasing, thereby not scoring the final mark. Some students put $3n - 2 = 10 - 2n$ and tried to solve this equation, not recognising that solving for n was not a correct approach.

Question 7

Most students approached this question by adding 9 minutes many times to 6.45 and then adding 12 minutes to 6.45. There were some arithmetic errors found when using this approach. Those that were able to do this accurately tended to get the correct answer of 7.21 am. Some students approached this by trying to find the LCM of 9 and 12 but many of these who found the LCM was 36 then failed to add this on to 6.45 am.

Question 8

Most students were able to access some marks on this set of questions testing algebraic skills.

Most had some idea of how to factorise $12e + 4$ but many of these students did not remove the highest common factor from the bracket writing an answer of $2(6e + 2)$ which did not score.

Students should be encouraged to look at their final answer to check their answer to ensure that the terms in the bracket do not have a common factor.
Part (b) was well answered although there were a few incorrect responses of $15c - 10$ and some got the correct answer but then lost the mark because they went on to write $15c - 10d = 5cd$.

Most students could cope with simplifying the variables but then added the 7 and 4 too, reaching an answer of $11a^4b^3$. Most students were able to score at least 1 mark. Although some students could factorise $x^2 - 49$ correctly, it was not uncommon to see $(x - 7)(x - 7)$ as the answer.

Quite a few students were able to expand the brackets into 4 correct terms but were then unable to combine $-6y + 7y$ to + y with many writing $- y$ (perhaps thinking the signs were different so the answer should be negative)!

Question 9

It was encouraging to see that many students drew an appropriate line from *D* on the diagram to make a parallelogram to help them with their calculations. However many thought that angle *ABC* was 140°. Students should be encouraged to show their calculated angles on the diagram for clarity as they often did not write down which angle they were calculating when doing calculations. Although many students worked out that *x* was 24°, students are still missing out key words such as "angles" in their explanations and most did not give any reason relating to parallel lines or a parallelogram which meant they could not access the 2 marks for giving reasons.

Question 10

Many students did attempt to make a common denominator but often they only managed to get one of the two fractions correctly converted so could only access two of the three marks available. Others added the fractions correctly but forgot to add the whole number. Some started by converting the mixed number into an improper fraction but then could not cope with 19 × 7. Others left their answer as an improper fraction.

Question 11

There were many correct responses to part (a). However it was not uncommon to see answers of 78×10^{-3}, 78×10^{-4} and 7.8×10^{3}.
In part (b) many students had the right idea that 3 zeros were needed after the 671 but many wrote 6.710000, keeping the decimal point after the first digit. 671 000 was also a common incorrect response.
In part (c) many thought 91/2 was the same as 9.5 and showed this in their working. Others wrote that 9^{0} simplified to 9.

Question 12

Not many students could work with coordinates in 3-D. Part (a) was not well answered and in part (b) it was not uncommon to see students halving the coordinates of *A* writing an answer of (2.5, 2.5, 2.5).

Question 13

By far the most common response to this question was to start by finding 20% of 480 with answers of 96, 480 − 96 = 384 and even 480 + 96 = 576 being very common. Few students understood that this was a 'reverse' percentage problem.

Question 14

This question was not well answered with few students getting this fully correct. Many scored 1 mark for either finding the length of one of the two missing sides or, more commonly, finding the area of a rectangle. A few managed to get the correct simplified expression for the area but nearly all of these students lost the final mark as they left their answer as an expression and not a formula.

Question 15

Most students got as far as finding the coordinates of *M* but no further. This did not score any marks. It was evident that students struggled with finding the equation. Few of those students that attempted to find the gradient of *AB* recognised that the gradient should be negative and even fewer students knew how to find the equation once they had found the gradient.

Question 16

This question tested the more able students. Many of these students attempted to expand the numerator but had no idea what 'rationalise the denominator' meant.

Question 17

Most students thought they could just cancel the x^2 etc and had no idea that factorising the expressions was needed. Those that did factorise tended to be able to factorise the numerator correctly but found it more difficult to factorise the denominator. Most who could correctly factorise both then went on to cancel correctly and provide the correct answer.

Summary

Based on their performance on this paper, students should:

- be encouraged to write as much information they can on given diagrams. For example in question 5 it would help writing 300 cm next to the 3 m on the diagram and showing how many 20 cm fitted on this side on the diagram, in question 9 it would help writing any of the angles calculated on the diagram and on question 14 it would help writing the lengths of the missing sides on the diagram.

- be made aware of the key words necessary for geometric reasons. The underlined words in the mark schemes for these sort of questions are key to scoring reasoning marks. For example, in question 9, it was not uncommon to see "a straight line = 180°". This is not acceptable as the mark scheme stated: "angles on a straight line add to 180°" and the word "angles" was missing.

- work with consistent units when given 2 diagrams where one diagram has units in metres and the other in cm, it is advisable to convert to the same units before working out areas as length conversions are much easier to process than working out area conversions.

- show all relevant working. For example on question 14, 4x2 + 5x was seen in the left side of the shape. This probably came from 2x (2x + 3) but without this evidence shown the method mark could not be awarded.

Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:
http://www.edexcel.com/iwantto/Pages/grade-boundaries.aspx

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