

Principal Examiner's Feedback

November 2016

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 2

Introduction

Students were able to answer the questions in the allotted time.

There were plenty of examples of good working shown in responses by students allowing examiners to award method marks even with an incorrect final answer.

Blank responses were rare, with most students at least attempting all questions.

Evidence suggests all students had a calculator for the exam, students should ensure these are used appropriately to check arithmetic.

REPORT ON INDIVIDUAL QUESTIONS

Question 1

Both parts to this question were answered well. The vast majority received both marks in part (a). In part (b) students tended to either score full marks or struggled to correctly substitute, or showed correct substitution but then calculated incorrectly, or with the wrong order of operation.

Question 2

Surprisingly less than half of students scored anything in part (a). Typically, like on the foundation tier, this was due to forgetting to multiply the second term when expanding the brackets. Those who expanded correctly normally then simplified correctly too. Parts (b) and (c) were answered much better with the vast majority collecting the final 2 marks.

Question 3

Nearly $\frac{3}{4}$ of students scored at least 2 marks for correctly deducting 10% and then sharing 180 in the correct ratio. Quite a few forgot to then include the 20 staff spaces in the total at the end, but more than 50% did include it and hence scored full marks.

Question 4

It was a surprise to see this plan question cause so many problems. More than 80% of students scored zero, and most of these attempted a 3D drawing rather than a 2D plan.

Question 5

About two thirds of students were able to score some marks on this question. Of those who did the majority normally scored one mark for finding either ABD or DBC . A small proportion were then able to finish the problem to find y . However, almost no students gained any communication marks for the reasons they gave.

Question 6

The most common scores here were either zero or full marks, with about 40% of students getting each of these outcomes. It is clear that a large proportion of students are unsure of the formulae for common compound measures such as speed and density.

Question 7

As with a few other questions, students either scored full marks or no marks. Almost all students attempted the question but a large number had no real idea how to convert between miles and kilometres despite being given the conversion in the question. There was also evidence of students not using the calculators and being let down by poor arithmetic.

Question 8

As on the foundation paper, this question posed problems for many, even those who understood the formula for the volume of a prism. This was primarily down to the complex cross section. Around 30% of students scored 1 mark, normally for finding the volume of a single prism (e.g. $10 \times 2 \times 1.5$). Unlike on foundation though, around 20% went further, and the majority of these scored full marks.

Question 9

This question proved to be a good discriminator with a range of methods, answers and scores seen. The most common, and easiest, approach was to substitute into the two given expressions and then divide the values gained. Those who attempted to factorise normally didn't get very far.

Question 10

In part (a) a majority were able to write down the value of 7° , but most struggled with the fractional and negative powers. In part nearly half of all students scored both marks.

Question 11

More than half of all students were unable to score any marks here. Fractional arithmetic is a vital skill and it is apparent that it is one with which students need further support to improve.

Question 12

Part (a) was approximately a 50/50 split in those who scored zero and one. Those who didn't score often ignored the negative sign in the power leading to an answer of 23 000. Part (b) was accessible to most with over 80% achieving at least one for a correct conversion of a single value, or the order reversed.

Question 13

3D coordinates is a topic where many students struggle to visualise the given situation. This question was slightly different to many seen in that the shape didn't have a vertex at the origin. In part (a) many were able to deal with this, but the extra complication caused many problems in part (b). It is important that centres give students experiences of problems with different solids placed in different positions on the axes.

Question 14

By this stage of the paper a majority of students struggled to access some of the content. Nearly two thirds of students were unable to gain any marks, despite the relatively easy first mark for spotting a 90° angle between tangent and radius. Of those who were able to find the correct value for BAC almost none were able to score full marks because, as in question 5, reasons given were either incorrect or incomplete.

Question 15

A decent proportion of students was able to gain some credit on this higher level question for factorising either one or both expressions correctly. Of those who factorised both correctly, most then simplified the fraction correctly to gain full marks.

Question 16

Only a very small minority of students was able to substitute the given expressions into the formula for the area of a trapezium, despite that also being on the formula sheet. When they did, about half then went on to gain full marks.

Question 17

Despite being a fairly common style of question in recent series only around 15% of students gained any marks. Those who did typically either scored 2, normally for correctly finding the gradient of AB and the perpendicular gradient, or scored full marks.

Summary

Based on their performance on this paper, students

- need to spend more time mastering the basics of algebra such as expanding and factorising.
- need to earn the geometric reasons ensuring that all key words are included.
- should take care with arithmetic and use calculators when available.
- should spend a greater amount of time ensuring they fully understand fractions and are able to complete the 4 operations with them.