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# Principal Examiner Feedback

# November 2015

Pearson Edexcel GCSE
In Mathematics B (2MB01)
Higher (Calculator) Unit 3

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**GCSE Mathematics B (2MB01)**
**Principal Examiner Feedback – Higher Paper Unit 3**


**Introduction**

There were fewer students who took this paper than previous series. Performance was polarised mainly at the lower end with those who were clearly aiming to pass at grade C. There was also a much smaller group at the upper end. There was some evidence of a concerted effort to gain marks on certain questions, whilst there were some topics where performance was very weak, and a significant failure to even attempt questions relating to these topics would suggest that decisions might have been taken not to prepare students for them.

Performance on unstructured questions was better near the front of the paper, but much weaker in the later parts of the paper however, there were too many attempts that resembled trial and improvement approaches.

The inclusion of working out to support answers remains an issue for many; but not only does working out need to be shown, it needs to be shown legibly, demonstrating the processes of calculation that are used. There were too many instances in this paper where working out was set out in such a disorganised way that it was almost impossible to identify a chosen route of solution by the student, in order to award method marks. This was particularly the case with working out presented on additional sheets.



**Report on Individual Questions**

**Question 1**

This question was answered well with only a few unable to process the calculations in the correct order. The main error for a few in part (b) was in

leaving the answer written as $\dfrac{1}{400}$

**Question 2**

Performance was disappointing for a question so early in the paper. Bearings is clearly a topic in which there are many weaknesses, as there were many who drew the wrong angle. There was also a significant minority whose accuracy was poor, perhaps even suggesting that they were estimating without having a protractor. In part (b) more care was needed in measuring the length between the two points; some failed to notice the answer was required in kilometres rather than centimetres.

## Question 3

It was common to find students working out the comparable total costs of buying the bottles and cans, and to then make a comparison of these two costs, without taking into account the differing capacities associated with these costs. For most therefore, it was a maximum of 3 marks. Otherwise there were many different, but creditable methods seen. The two differing discount methods appeared to be well understood.

## Question 4

It was rare to see a complete correct solution in (a). Many confused "translation" with "transformation" whilst it was not uncommon to find the 3 and the $-3$ reversed. The only common error in part (b) was in choosing a point of rotation other than (0,1), usually (0,0), (−1,1) or (1,0).

## Question 5

This was well answered. The most common method of solution was using a trial and improvement approach.

## Question 6

There were many correct lines drawn. Some presented an incomplete construction by using only one pair of construction arcs with a measured point on the line.

## Question 7

This was usually well answered, though many lost a mark by failing to use a trial between 4.41 and 4.5 (to a 2nd decimal place) or in failing to give their answer to 1 decimal place as required.

## Question 8

There were many confused attempts, with disorganised work which was frequently conflicting. The most successful approaches involved trying to find the area of the cross-section, though division into rectangles regularly involved the choice of incorrect dimensions.

## Question 9

A well answered question in which the only significant error was in joining the points with line segments.

**Question 10**

There were many trial and improvement approaches to this problem, most of which resulted in no marks in failing to reach a solution. Many of the algebraic approaches were flawed, in that students chose to use *x*, 3*x* and 6*x* as the three terms. Finally the hurdle of having to simplify algebra and manipulate terms to solve an equation was too much for many, who made mistakes in handling minus signs. Overall many poor attempts.

**Question 11**

There were many successful answers in part (a). But in part (b) students frequently chose the wrong inequality sign, or used an equals sign instead. Those who could see the relationship between the numbers in part (c) just wrote down the correct answer; others merely wrote out the sequence for one of the series, or included all possible numbers from either series.

**Question 12**

Very few correct answers were seen. Whilst many could take the first step in working out a mass (18 or 250 stated) the subsequent failing was an inability to realise that a division of 265 was needed for the total mass.

**Question 13**

A well answered question in which students preferred to select a value for the motor bike, and then proceeded to show how the depreciation differed for a simple, or compound approach. With a clear comparison at the end this could attract full marks. Lengthy expositions without any mathematical calculation, on the other hand, gained little credit.

**Question 14**

From this point in the paper there were an increasing number of non-attempts. In this question it was only a minority who made an attempt, and usually no marks were gained because of an inability to square both sides to remove the square root sign as the first step in processing.

**Question 15**

There were too many hurdles for the few that attempted this question. Use of an incorrect formula, failure to include the straight edges, processing and rounding errors all resulted in few providing an acceptable final answer. Fortunately, at this stage in the paper, most students who attempted the question provided working out that was clear enough for some method marks to be awarded.

**Question 16**

There was much disorganised work in the few attempts seen. It was not uncommon to find the left hand side of the equation resolved into a single statement without resolving the denominator on the right hand side.

## Question 17

The majority who attempted this question made the fatal error of assuming that the opposite angles of a cyclic quadrilateral were equal, rather than supplementary.

## Question 18

Students chose either to factorise, or use the formula. Few gained full marks due to either a failure to factorise correctly, or a processing error using the formula.

## Question 19

The few that attempted this question did so by finding a linear, rather than a quadratic formula to use for the solution.

## Question 20

Few chose the correct bounds to use, and of those most incorrectly chose both lower bounds as part of the calculation.

## Question 21

Most realised that Pythagoras's Theorem was needed, and it was not uncommon to see the first marked gained for this approach. But very few were able to proceed beyond this. A few realised that simple trigonometry was needed, but were unable to formulate a correct approach. As a result many gave up after having used Pythagoras's Theorem to find a length.

## Question 22

Many gave an answer to part (a) that was clearly nothing more than a guess, in nearly all cases providing the wrong answer, with few even attempting part (b).

**Summary**

Based on their performance on this paper, students should:

- present working legibly and in an organised way on the page, sufficient that the order of the process of solution is clear

- include working out to support answers. This continues to need emphasis at a time when the demand for working out for some questions is increasing

- spend more time ensuring they read the fine detail of the question to avoid giving answers that do not answer the question

- be prepared for a greater range of topics if they are attempting a higher level paper, and in particular to use algebraic manipulation more successfully.

- bring the full range of equipment to the examination: in this case including a ruler, a compass and a protractor

**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