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Principal Examiner Feedback

Summer 2016

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

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GCSE Mathematics 2MB01
Principal Examiner Feedback – Foundation Paper Unit 2

Introduction

The number of students sitting this paper was relatively small. There were few very weak performances. Students sitting this paper seemed to have been appropriately entered for the foundation tier.

Students were generally able to complete the paper in the time allowed. They found that the paper gave them the opportunity to demonstrate positive achievement.

Students generally set out their working in a clear, logical manner. Exceptions to this were Q15, Q17 and Q18 where working was sometimes jumbled.

Report on individual questions

Question 1

This question proved to be an accessible introduction to the paper. All parts were answered very well.

Question 2

"Square" was the most popular response to part (a) of the question.

Naming the solid in part (b) was usually also correctly answered. There were however a wide variety of unacceptable answers such as disc, podium, oval, cube and sphere.

Where compasses were used, answers to part (c) were generally accurately drawn though not all students used a radius of 4 cm. Circles with diameter 4 cm or radius 5 cm were sometimes drawn. Circles were nearly always centred on the cross given. There were a large number of responses where it was evident that either compasses or a ruler were not used and many poor freehand sketches were seen. Normally they did not qualify to be awarded the mark available.

Question 3

This question testing negative numbers was quite well answered. The most common incorrect response in part (a) was "Edinburgh".

Nearly all students gave one of the acceptable responses: 5, −5 or +5 in part (b)(i). Part (b)(ii) was less well answered with 0 being a commonly seen unacceptable response.

Question 4

Part (a) of this question was answered well, but some students gave an answer of 4cm which did not lie within the acceptable tolerance. Some students did not answer the question which suggested that they may not have had access to a ruler.

In part (b) most students used arrow notation successfully to indicate a pair of parallel lines. On occasion only one line was marked with arrows, and in some scripts, answers were contradictory with one pair of correct parallel lines and one pair of lines which were not parallel indicated as parallel.

Unfortunately, answers to part (c) were often ambiguous, with "x" marked at a vertex, but without an arc to indicate which angle was intended. The mark could only be given if the x was unambiguously placed.

Either the obtuse angle or the reflex angle could be marked as a response to part (d) and if the intention was clearly to mark an angle at D, the mark was awarded. Unacceptable responses commonly seen included marking y along one side and marking y at all three of the vertices *E, D* and *C*.

Question 5

This question was generally well answered with clear working and a clearly stated conclusion. Those students using multiplication (eg 10 × 53) were more successful than those using repeated addition. The latter method often included errors in the arithmetic.

Question 6

Many students used "angles on a straight line" rather than "opposite angles" to find the size of the angle marked x in part (a). This sometimes led to incorrect answers caused by incorrect arithmetic and 68° was a commonly seen incorrect answer.

Part (b) was answered successfully by approximately the same proportion of students as part (a). Commonly seen incorrect answers were 105° and 135°.

Question 7

Part (a) of this question was answered correctly by the vast majority of students who usually gave "$\frac{1}{2}$" as their answer rather than "$\frac{10}{20}$".

Part (b) was also quite well answered. Students usually used the diagrams to shade $\frac{2}{3}$ and $\frac{5}{7}$ of the rectangles provided. Fewer students wrote the fractions with common denominators though some more able students used this as a check that their response using the diagrams was correct. On occasion, students shaded the diagrams but did not provide a conclusion.

Question 8

Almost all students identified correctly the number of stars in Pattern 5 and most students also identified the number of triangles in Pattern 6, though some students counted the number of triangles in the next pattern, Pattern 5.

More able students also answered part (c) correctly. Some less able students drew an incorrect diagram which consisted of a parallelogram formed from the triangles rather than a trapezium. ome students found the number of triangles corresponding to the pattern with 5 stars then doubled this to find the number of triangles corresponding to the pattern with 10 stars, a clearly incorrect strategy.

Question 9

Point *E* was correctly identified as the answer for part (a) by most students. The most common incorrect response was *D*, corresponding to the point (1, 4).

In part (b) students usually plotted a point which with points *A*, *B* and *C* formed a kite. Sometimes students failed to label the point but the mark was awarded provided the answer was unambiguous. Writing down the coordinates of *P* was not done as well as might have been expected with many students writing down the *y* coordinate as the *x* coordinate and vice versa.

Question 10

This question attracted a good proportion of correct answers, though 70 was an often seen incorrect answer obtained from 210 ÷ 3 or from 210 ÷ 30 = 70. Examiners were left wondering whether a large number of students had equated 30% with one third. Some students reduced the number of counters by 30%, giving 147 as their final answer. This question was not always attempted.

Question 11

Most students were able to use the graph to convert 5 kilograms to pounds in part (a) though a misinterpretation of the scales led many students to give an incorrect answer.

Part (b) was not well done and part marks for a correct method were not given very often. Many weaker students simply added 150 (pounds) and 64 (kilograms).

Question 12

A small proportion of students found this question straightforward and scored full marks but regrettably, many students confused perimeter with area and were not able to gain any credit for any subsequent working. Students who used the perimeter to work out the costs generally worked with accuracy. Some students did not consider all three types of border and so only reached a partial solution.

Question 13

Under a half of all students showed any understanding of significant figures and under one third of students scored both marks for their answers to this question.

Answers to part (a) were more often successful than answers to part (b). A very common error in part (b) was to give 6.0 as the answer. Students did not realise that the “0” signified that the number was being written to 2 significant figures.

Question 14

The simplification of simple algebraic expressions was handled quite well with high success rate for parts (a), (b) and (d).

Part (c) was less well answered and x^6 was a very common incorrect answer given by students.

Question 15

The most successful approach to this question was where students calculated the number of boxes which would fit along the edges of the container. There were many clear, concise and accurate solutions from this approach. Where students worked out the volume of a box and the volume of a container there was much inaccurate working and confusion with units. Completely correct solutions using this approach were uncommon.

Question 16

This was the least well attempted question on the paper. Students who attempted the question were clearly under-confident with the algebra they were handling. It was very rare to see a complete solution with the appropriate use of brackets which led to a correct formula for the area in terms of x. A small proportion of students realised what they needed to do and scored one mark for a correct expression for the area of a relevant rectangle or for an attempt to write an expression for the total area, albeit with incorrect notation - for example the omission of brackets.

Question 17

This question acted as a good discriminator for the more able students who took this paper. The best students worked accurately and reached a fully correct solution, usually by listing multiples of 24 and multiples of 36 until they reached the first common multiple of 24 and 36 higher than 250, ie 288. Unfortunately, many students' working was blighted by poor accuracy. It was common, however, for examiners to be able to award at least 2 marks for a largely accurate attempt to write down multiples of 24 and multiples of 36.

Some students did not take into account that their solution must include making sure that there were enough book marks and dust covers for 250 books, so produced solution such as 3 boxes of book marks and 2 packs of dust covers.

Question 18

Also a good discriminator, there were some completely correct solutions to this geometry question and where a solution was not complete, it was often possible for examiners to award partial credit to students who had made some progress.

The most common error made was in the calculation of the size of angle *PTR*. Some students worked out the size of the angle *QRD* then stated that angle *PTR* was the same size. This was without foundation as there was no indication that the line *PT* was parallel to the line *QR*.

Summary

Based on their performance in this paper, students should:

- make sure they have a good understanding of the scales used on graphs before they take readings from them
- read the specific demands of a question to ensure they take account of all the information given
- check that all their numerical calculations are accurate
- practise answering angle questions which require several stages of working

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