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Principal Examiner Feedback

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Pearson Edexcel GCSE
In Mathematic A (1MA0)
Foundation (Non-Calculator) Paper 1F

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GCSE Mathematics 1MA0
Principal Examiner Feedback - Foundation Paper 1

Introduction

The paper was accessible to all students, with every question attempted by most students.

There were many errors in basic calculations such as addition, subtraction and multiplication of 2 numbers. Students who used the partitioning method for multiplication generally got the correct answer. However, it was disappointing to see many using this method to calculate, for example, 56 × 1000. These basic errors often led to many marks lost even though it was clear they fully understood how to answer the more complex questions.

Report on individual questions

Question 1

This question allowed students to make a good start to the paper with most students getting parts (a), (c) and (d) correct. Although most students wrote that Lhotse was the highest mountain some candidates gave the height of 8516 instead which meant they could not score the mark. Most students could write 8188 to the nearest hundred with the common incorrect responses being 8100, 8000 and 200.

Question 2

Part (a) was well answered with nearly all students scoring at least 1 mark.

The most successful students drew a bar chart to show Liz's results. The most common error was failing to label the vertical axis in an acceptable manner. Many others lost marks because they could not scale the vertical axis correctly by commonly scaling 1 block between 0 and 1 and then 2 blocks between the rest of the integers. Occasionally an accurate pie chart or some other accurate form of representation was seen but this was a rare occurrence.

Question 3

Most students answered part (a) correctly with the most common errors being 5600 or 560 000. It was surprising how many attempted a written long multiplication method to do the 56 × 1000.

The vast majority successfully completed the subtraction in part (b), most using the traditional column method. However a reasonable proportion struggle with the concept of “borrowing” leading to common incorrect answers of 376 and 186.

The majority of students obtained the correct answer of 6 in part (c), mostly by using the halving method. Incorrect answers seen included 8 through careless calculation and 18 derived by stating $\frac{1}{2}$ of 24 = 12 and then stating $\frac{1}{3}$ of 24 is 6 and adding these to gain 18.

The vast majority of students gave the correct answer for part (c). There were very few who got the order of operations incorrect.

Most candidates struggled to answer part (d) correctly. Nearly all the errors fell into one of two categories, namely those who ignored the correct order of operation, completing the calculations in the order they occurred leading to the most common incorrect answer of 4 and the large group who completed the division first, but then subtracted the wrong way round, leading to the answer of −13

Question 4

Almost all students got the first mark for 254 ÷ 20 or 5 × 20. This was generally well done but many thought that 254 divided by 20 was 127 and so lost the accuracy mark. Some tried repeated subtraction usually with some success. There were others who gave the answer as two and a bit days or something similar demonstrating their misunderstanding of the context of the question. Students relied mainly on working out the maximum bags for each day and then coming to the correct conclusion.

Question 5

The majority of students correctly identified B or C as the correct answer to part (a).

In part (b), students were less successful. Most struggled to identify any shapes that had rotational symmetry of order 2. Shapes F and H were common incorrect responses.

Part (c) did not prove to be a problem for most candidates and although 'Parallelogram' was identified by most students in part (d), this was often incorrectly spelt. Rhombus was the most common incorrect answer followed by rectangle.

Question 6

Students answered all three parts well with most students scoring 3 marks. Common errors were m^3 in part (a) and $8g$ in part (c).

Question 7

Part (a) was generally answered well. Some students showed no understanding of substitution to get 35 + 28 = 63. There were a number of students making very careless errors in the addition when they correctly found 15 and 16 or made errors in the product of 3 and 5 or 2 and 8.

The most common error seen in part (b) was to write $x = 6$ and $y = 8$ rather than write a correct expression. It was disappointing to see how many students got the correct answer and then tried to 'simplify' their answer by following this with $14xy$. This either lost them a mark when it was preceded by $6x + 8y$ (or $6x$ or $8y$) or scored no marks at all.

Question 8

This question was generally very well attempted. Almost all students worked correctly with one table and six chairs. Only a very few realised the cost of the table was the same for all 3 shops and could be ignored. The vast majority gained at least 2 marks and the odd incorrect calculation still allowed 3 marks. Common errors included only using 1 extra chair with Tables-R-Us, getting the wrong number of chairs when using an addition method for the chairs at Fred's Furniture, working out the cost of 12 chairs for Tables 'n Chairs (i.e. using £70 as the cost of one chair) and working out the total cost for comparison and forgetting to add on the cost of the table for one shop. Failure to comment fully on the results of their calculations was the reason for failing to gain the mark for communication.

Question 9

This was generally answered well. Most students that secured 2 marks did so by first correctly finding 10% then 5% and then adding the two amounts. Others found 15% by writing 320 × 15 ÷ 100. A significant number of students worked out that 15% was 48 but then lost a mark for not reading the question properly and going on to subtract this from 320 or add it to 320.

Question 10

The vast majority gave the correct answer to part (a). There were a few who misunderstood the question and gave an answer of 2 possibly because this was the lowest number on the spinner.

Most students displayed a worrying lack of basic understanding of probability in part (b). The most common response was “likely” probably because 2 appeared the most times on the spinner.

In part (c) many students used words, either on their own or with a fraction, to write down the probability that the spinner will land on 3. "Evens" was a common incorrect answer. Those who used fractions generally did well. A number of students are still expressing probability using incorrect notation and it was not uncommon to see an answer of 2 : 6 which could only score 1 mark.

Question 11

The majority of students scored full marks in both part (a) and part (b). The common error in part (a) was to isolate tenths from units giving an answer of 41.13 but as they had indicated their intention to add still scored a method mark.

In Part (b) students who got this wrong often changed the timings to minutes i.e. 110 minutes and performed a normal subtraction or correctly added to get 1 hr 50 minutes but then could not accurately perform the necessary subtraction sum. A small minority tackled the problem in a trial and improvement method by starting at various times and adding on hoping for 14 30. This was rarely successful.

Question 12

Very few candidates were awarded full marks. 10 and 15 were seen often but in most cases only scored 1 mark as they added them together instead of multiplying. Correct conversions of 2 m and 3 m were frequently seen as was 200 ÷ 20 and 300 ÷ 20. Those failing to score any marks showed in the most part an inability to understand what the structure of the question entailed. Another common misunderstanding was to divide an area of 6 square metres by 40 square centimetres

Question 13

Most students seemed to have the correct idea of what needed to be done to answer this question and many were successful. Errors that did occur were often as the result of misreading scales. A number of candidates converted both 280 miles and 500 km when only one was necessary and some then compared the wrong values. A few converted correctly and then came to the wrong conclusion or failed to give the units (km or miles) with their final answer, losing the final mark. The final statements were on the whole well written, although some students failed to get the last mark due to choosing London as further despite their figures telling them the opposite. There was a frequent misunderstanding of the scale, for example 40 miles = 60.2 km or 61 km.

Question 14

The majority of students scored at least one mark for correctly enlarging at least 2 sides. Many were confused with the slanted sides, unsure of how long and at what angle to draw them whilst others were unable to count 9 squares across. A small number of students completed a correct enlargement of scale factor 2, scoring 1 mark. There was also a number of students who just made each side 3 squares longer.

Question 15

The majority of students had the correct answer of 18 in part (a). A small proportion of incorrect answers were 4 and 22.

Part (b) was well answered. Only a few students incorrectly identified 23 as their answer indicating they had not read the question carefully and wrote down the height of the smallest tomato plant instead of the tallest.

Most students correctly worked out the range as 33 or stated the maximum and minimum values but then made a calculation error. Most errors were in the subtraction. Others wrote a long list of numbers, probably confusing the range with mean or median.

Question 16

Students most commonly showed the sequence continuing but they often made an error when adding 3 (usually after 29 i.e. 29, 33). Too often students got as far as 32 but did not go beyond therefore missing out on the final mark. Others gave perfectly acceptable answers but followed this by writing "34 is not in the 3 times table" which lost them the final mark.
Although $3n + 2$ was sometimes written, a complete solution using this expression was rare.

Question 17

There were many incorrect responses to this question. 32 was a popular incorrect answer from 5 + 7 + 20. Many students tried to find the surface area and most either left the units blank or wrote cm^2. Poor arithmetic also let many students down when finding the product of 20, 5 and 7.

Question 18

This question was answered correctly by most students with many scoring full marks. Some students showed all their working on the diagram, dividing their line into 4 sections each 3 cm in length. Errors seen were usually distances outside the tolerance allowed or an incorrect conversion to km. Common errors were either incorrectly using the scale or dividing the wrong way round. Many students did not understand what was required and merely used the given numbers writing 300 ÷ 100 = 3.

Question 19

The correct answer of £1340 was seen quite often with full method on display. Most students were able to use the correct methods but these were, in many cases, spoilt by poor arithmetic. A significant number thought the cost of the tickets was 500 divided by 4. Arithmetically the main errors were 960 − 300 = 600 and 2000 − 660 = 1440.

Question 20

A surprising number of students were unable to make a correct start to part (a). Of those students who did write $\frac{150}{360}$, most were unable to cancel the fraction fully. $\frac{1}{3}$ was a common incorrect response.

A large proportion of students were simply unable to make a correct start to answer part (b). Many of these students tried a build up method, but quickly got lost. Those students who did make a correct start generally went on to get the correct answer.

Many students did not appreciate that each pie chart could represent a different number of cars and so incorrectly identified Bragdon as having most silver cars because it had the bigger sector. Those students that ticked 'not enough information' almost always stated the correct reason showing a good understanding of why they could not say which car park had the most silver cars.

Question 21

This was a testing question and most could not put together the various strands of the method to complete the question. Most students scored marks for either one quarter of 600 or for 4500 divided by 750 or both. The arithmetical ability to do these tasks was clearly limited in so much as to divide by 4 many needed to divide by 2 twice and the division of 4500 by 750 was frequently done by a "build up" method.

Question 22

Many students correctly realised that angle *BFG* was 65 but few gave the correct reason, often stating that it was a corresponding angle. "Alternative" and "alternating" were also common incorrect reasons given.
There were two predominate errors seen in this question. The first was to use angle *BGF* as the other base angle of the isosceles triangle leading to an incorrect answer of 115 for *x*. The second was to assume that angle *CBG* = angle *ABF* = 65^{o}. These students then went on to work out angle *FBG* = 50.
Marks were also lost because students were unable to express the appropriate reasons in an acceptable form missing out key words or by not giving a complete set of reasons.

Question 23

All students attempted this question and most were able to provide at least one thing wrong with the question in part (a). However, many students wrote down stock phrases such as "no time frame" even though a time frame was not appropriate for the given question. Many found it hard to articulate 'overlapping' boxes as a reason.

In part (b) too often their question did not specify a time period. The response boxes were not always exhaustive, 0 being most commonly left out. Many others thought they were asking a question about distance, suggesting the students were not reading the question carefully enough.

Question 24

This was generally answered poorly. Many were not aware of what was required and attempted to incorrectly simplify the expression as $8e^2$ or $8e^3$. Of those that attempted to factorise, many students gave $3e$ or 3 as a factor.

In part (b) many gained a mark for expanding the bracket with only the most able students going on to isolate the terms in k. A few students gained the correct answer by trial and improvement. Students need to be made aware that using the method of trial and improvement in questions such as this is a risky strategy as they will either score all the marks for a correct answer or no marks at all.

Students seem to have very little understanding of the process of changing the subject of the formula. In part (c) those that had some understanding commonly did the operations in the wrong order, leading to $a = (f - 1) \times 2$. Others simply swapped f and a.

Question 25

There were many blank responses to this question. Many had little idea of what was required and simply wrote down some factor pairs for 180. It was rare to see continual prime factorisation used and when it was, it was invariably incomplete. The most common and generally successful method seen was the factor tree method with many gaining 2 marks if it was fully correct or 1 mark for a partially correct factor tree. Only a few were able to use the factor tree to write the answer as the product of the factors. It was more usual to see a list of numbers or 15 (the sum of the prime factors).

Question 26

This proved difficult for most students although 15×8 and 11×15 were often seen. Even those students who subtracted 120 from 138 to get 18 failed to understand that their answer of 6 was not x and had to be subtracted from 15 to get the correct answer of 9. Many students were unable to grasp the task correctly and tried various multiplications which were not valid. Hardly any algebraic approaches were seen. Many assumed that the 15cm length was halved or that the two areas were equal. Trial and improvement was also a common method.

Summary

Students should be advised to

- bring all necessary equipment to the examination
- consider whether their answers are realistic, especially with calculations that involve division. For example, in Q4, 254 ÷ 20 = 127 was a common error.
- practise with calculations involving basic arithmetic such as addition of 2 or more numbers, subtraction, simple multiplication and short division
- show a full method when working out a percentage of a quantity
- ensure they read all questions carefully.
- ensure that, when designing a question for a questionnaire, their response boxes must be exhaustive.
- write down a statement for starred questions; circling an answer is insufficient.
- express a probability as a fraction, decimal or percentage and not as a ratio.

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