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Principal Examiner Feedback

Summer 2013

GCSE Mathematics (2MB01)
Paper 5MB3F_01 (Calculator)

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GCSE Mathematics 2MB01
Principal Examiner Feedback – Foundation Paper Unit 3

Introduction

This unit 3 paper was found to be reasonably straight forward at the start with a number of questions that caused some candidates problems towards the end of the paper. The paper gave a good range of marks for the award of grades. Generally speaking, the standard of straightforward algebraic knowledge was not very good as candidate's tended to use trial and improvement methods. Unless a trial and improvement method leads to a correct answer then no marks are awarded unless trial and improvement is the focus of the question. Candidates usually gained more marks for using an algebraic solution in those questions where an algebraic method could have been used than using a trial and improvement method.
A significant number of marks were lost where candidates did not write down a statement of the result in the starred questions. Circling an answer is insufficient as we need to see a statement giving the required decision. A statement of how to work something out will also not gain any marks when questions asking for an explanation is asked.

Report on individual questions

Question 1

This question was very well understood and well answered with almost all candidates scoring full marks.

Question 2

This bill type question was well understood. Almost all candidates were able to gain at least two marks usually for the number of balls of wool or the follow through on the total cost.

Question 3

This five mark geometry question gave a good spread of marks. There were many interesting ways of spelling octagon seen in part (a) but marks were awarded as long as the meaning was clear. In part (b) many candidates copied the diagram of the octagon or drew a hexagon but most candidates drew a pentagon and we did not demand that a ruler was used. Part (c) was well attempted with most candidates realising that that they had to add all the angles and subtract the total from 900 but only about a half of candidates gained all three marks in this part.

Question 4

Fractions often cause problems on a foundation paper but it was pleasing to see some good responses to this question. Many candidates wrote 1.2 instead of 0.5 as the decimal equivalent of $\frac{1}{2}$ whilst $\frac{5}{7}$ or $\frac{7}{5}$ was often seen instead of $\frac{3}{4}$ or $\frac{75}{100}$ or equivalent when the fractional equivalent of 0.75was asked for. Interestingly about 4 out of 5 candidates could write 19 out of 30 as a fraction.

Question 5
This comparison question was well understood and the majority of candidates were able to give the correct answer of £240. A few candidates thought it was a best buy question and gave the answer of Monday which they had already been told in the question and some tried to work out 8 × £75 omitting the fact that two tickets cost £75 on Monday. A significant number of candidates did not use their calculator and errors were made with their written methods.

Question 6
In this question most candidates were able to make a start and give at least one correct route with the last stage missing being condoned for the first mark. The majority of candidates were then able to go on and find a correct route with a total for the second mark and the better candidates were then able to find the shortest route of 149 miles. Many candidates gave routes where Amir retraced his journey. Where most candidates fell down was that they omitted the statement that their chosen route was shortest. Circling an answer is insufficient evidence in starred questions such as this.

Question 7
Almost every candidate gave the correct answer to this question showing that this topic is very well understood.

Question 8
In contrast with question 7 this question was poorly answered with 60 ÷ 2 or 30 being given as an incorrect answer by almost all candidates. It was rare to see the correct answer of 31. Few candidates realised that an extra cone was needed at the start or the end. Some candidates were successful using the method of marking out the cones on either their own line or the existing line in the question.

Question 9
This six mark question testing functional elements for understanding a bank account with the interpretation of a line graph was well answered. Candidates scored good marks in the graphical interpretation and part (a) gave a good spread of marks as some candidates mixed up the £85 going out instead of in and the £45.56 going in rather than being taken out.

Question 10
Almost all candidates were able to give the congruent shapes but the success rate dropped significantly when it came to finding the shape that is similar to shape **A**.

Question 11
This question gave a good spread of marks and it was common to award one mark for the calculation of 18 × 24 or 432 given as the number of cans of drink bought. Fully correct answers of 417 were regularly seen though many candidates forgot to deal with the 15 cans that Michael had left over. Some candidates showed a lack of understanding of using applying by taking away 18 – 15 = 3 and performing calculations based on 3

Question 12
Parts (a) and (b) were often correct but part(c) caused the weaker candidates a problem as the use of trial and improvement methods did not easily give the answer of 2.6. Candidates that used an algebraic solution were more successful as one mark was awarded for showing the intention of subtracting 4 from each side of the equation and the incorrect simplification of the correct answer of $\frac{13}{5}$ was condoned. There were some candidates that gave 13 as their final answer but did not gain any marks due to a lack of working out shown.

Question 13
Almost all candidates had a ruler and protractor and most candidates scored one or two marks in this question with the measurement of the length being more successful than the measurement of the angle.

Question 14
Part (a) of this two part question was well understood and most candidates were able to find the correct cost of printing 20 invitations. Their performance went downhill in part (b) when they had to work backwards through the word formula where many candidates divided by 1.25 before subtracting the 4 and so failed to score any marks. Again here the candidates that adopted a more algebraic solution scored better marks that the usual hit or miss trial and improvement method. Though the lack of the use of brackets let most students down here

Question 15
Almost all the candidates were able to gain the mark for the distance of 8 kilometres but few candidates were able to give the correct bearing as 155º (with a tolerance of ± 2º allowed). Another group of candidates gained one mark when they gave and answer of 335 (± 2) for giving the reverse bearing but a large proportion of candidates were not able to even identify the angle they were asked to measure.

Question 16
Though this type of utility bill question is quite common on our papers candidates frequently came to grief with the subtraction of 130 from 730. They either failed to subtract them or sometimes ignored the fact they needed to be subtracted. Some students correctly calculated units but then incorrectly divided these quantities by the cost in pence. Many candidates made mistakes with the fact that the units of electricity were given in pence and there were some very large answers seen when candidates mixed up pence and pounds. The starred nature of this question was the correct money notation being used for the correct answer of £109.20. Those candidates that wrote their answer as £109.20p were awarded full marks as the extra “p” was condoned.

Question 17
Few candidates scored all four marks on this transformation geometry question. One was the modal mark awarded in part (a) as candidates often made a mistake with the bottom 9 cm line. In part (b) candidates often lost marks through using non mathematical terminology. Marks were awarded for derivatives of reflection e.g. reflected but not for flipped or mirrored and the correct line had to be stated i.e. y axis or $x = 0$. Many candidates of course made the usual mistake of calling it the line $y = 0$ or even $y = x$. Many correctly identified a reflection but then also thought there was a translation involved as well so lost marks as only a single transformation gained any marks.

Question 18
Interestingly the modal mark for this question was one. This was usually awarded for writing 9.2 for the $\sqrt{84.64}$. Many candidates did correctly calculate the correct answer but the majority of candidates at this level still cannot use their calculators effectively.

Question 19
This question was a good discriminator and gave a very good distribution of marks. Interestingly almost every single candidate attempted the question and the ones that scored no marks were the ones that drew a 3-D drawing of a cube or cuboid instead of the net. There were many correct answers and we ignored whether the net had flaps or not. The majority of candidates did realise that we needed to see six faces but a surprising number only gave us 5. They could score a maximum of two marks for their open box as long as the faces had the correct dimensions.

Question 20
The candidates that had the most success with this question were those that adopted an algebraic approach. They had an easy route in with one mark available for using n, $2n$ and 15 added to equal 63. They could then score a second mark for subtracting 15 from each side of their equation. The candidates that used a trial and improvement method usually fell down because they were confused by the 15 and that we wanted to see a logical approach evidenced by at least two pairs of numbers in the ratio 1 : 2. The candidates that tried an intuitive approach by subtracting 15 from 63 usually went wrong because they divided the 48 by 2 and not 3.

Question 21
Candidates right across the ability range were able to score marks in this question. This multi-step question gave a good distribution of marks as it was possible to award marks for the subtraction of 900 and the division by 6 independently of the addition of the calculation of 20% of £3500. Surprisingly a large number of candidates were unable to find 20% of a quantity with many dividing by 20 and trying to use £175. These candidates did not score the second method mark as we needed to see a correct method for increasing £3500 by 20%.

Question 22
Best buy questions are a regular visitor to our papers and though the numbers were not straightforward many candidates were able to make a start on the question either by trying to find the number of grams per penny or pence per gram. Many candidates gained two marks by calculating the small and the medium bottle costs for 1710g . As this is a starred question we were strict on the writing of the calculations we would accept for the second and third method marks. The calculations that could lead to comparative figures for two or three bottles all had to be written in either pounds or in pence, not a mixture. For the award of the final communication mark all answers had to be correct and there needed to be a statement of which bottle was the best value for money. Interesting xx% of candidates failed to score a mark in this question

Question 23
Pythagoras' Theorem questions are also firm favourites on these papers and here again candidates did not score as well as they might have done. They made the usual mistakes of doubling instead of squaring, dividing by 2 instead of square rooting, adding the lengths instead of the squares of the lengths and even subtracting the squares of the given lengths. There was some evidence of candidates trying to use scale drawing but these almost always unsuccessful as the required accuracy of the answer was too great for their drawing.

Question 24
The success rate on the trial and improvement solution of cubic equations is increasing but we still have many candidates not making the extra trial in the second decimal place e.g. 4.85 to check whether the answer should be 4.8 or 4.9. There were also some candidates who, having correctly trialled 4.85 then failed to write 4.8 as their final answer, instead writing 4.85 or their trial answer.

Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:
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