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Principal Examiner Feedback

Summer 2013

GCSE Mathematics Linked Pair Pilot
Methods in Mathematics (2MM01)

Foundation (Calculator) Paper 2F

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GCSE Mathematics 5MM2F
Principal Examiner Feedback – Foundation Paper Unit 2

Introduction

Candidates were generally well prepared for this paper although it was clear that some topics were very much weaker than others. Understanding of inequalities, Pythagoras and menstruation of a circle was poor.

It is disappointing to see so many arithmetical errors made on a paper for which candidates have access to a calculator.

Report on individual questions

Question 1

The vast majority of candidates were able to score at least 3 out of the 5 marks available in this question.

Question 2

Part (a) was generally answered well; however a common error was to multiply the 3 by 4 before adding the 7 to give an incorrect answer of 19.

In part (b), the most common incorrect answer was 11 found by correct division by 4 but then adding, instead of subtracting, the 3.

Many candidates were confused by the algebraic context of parts (c) and (d), trying to find values for x and y.

Question 3

Most candidates gained full marks in parts (a) and (b).

In part (c), parallelogram and trapezium were common mistakes.

Part (d) was quite well answered, with so many aspects of the given shape being worthy of credit.

Question 4

All parts in this question were usually correctly answered, showing confident use of a calculator.

Question 5

This was another question where the majority of candidates gained full marks. There was evidence of good use of a number line, although this did lead to careless errors of 9 and 11 in part (a).

Many candidates in part (b) simply reduced 8 by 12 to give an answer of -4.

Question 6

Most candidates scored well here. Correct monetary notation was not being assessed here which was fortunate since very many answers of 21.9 were seen.

Question 7
In this 3D configuration each of the cubes was actually visible and this helped many to gain the mark.

Question 8
Part (a) was generally well done with few mistakes.

In part (b), most candidates recognised that the larger triangle was an enlargement of scale factor 2, but many could not explain this clearly. Just saying that the larger triangle is "double" the smaller one was not enough to gain the mark.

Question 9
Although part (a) was done well, an answer of 50% was not uncommon.

Part (b) was less successful, 1.7 being a common error.

In part (c), a correct fraction of $\frac{40}{50}$ was often not fully simplified or in some cases over simplified with working such as $\frac{4}{5} = \frac{2}{3}$

It was disappointing to see so many candidates unable to find three quarters of a quantity, many just finding one quarter and many with totally incomprehensible methods.

Question 10
Part (a) was well answered with the most popular approach being to sum the two given lengths before subtracting to give an answer. A significant number however did find the difference between 7.8 and 9.6.

In part (b), many followed incorrect approaches, often ignoring the given length of TU = 3.8 cm and simply halving 7.53 and adding the result to 5.35. A number of candidates lost the final accuracy mark as a result of premature approximations, such as 5.35 + 3.73 = 9.1

Question 11
The major error in part (a) was to work out 82 × 6.

In part (b), 144 × 6 was the most common mistake.

Question 12
Parts (a) were usually correctly answered although sight of 26 was not uncommon.

In part (b), correct substitution often leads to an incorrect answer resulting from a mental arithmetical error. An answer of 59 was also seen often from 35 + 24

Question 13
Parts (a) and (b) rarely caused candidates any great concern and full marks were the norm.

Although often well done, answers of 74 and 0.37 were common in part (c). Candidates who took the trouble to convert the given numbers to a common format, in the main decimals, usually gained full marks. Those trying to simply write the numbers in order often misplaced $\frac{2}{7}$ or 0.35

Question 14
$\frac{3}{10}$ was the most common error in part (a).

In part (b), many candidates failed to read the demand of the question carefully enough and often gave fractions which are recurring decimals as their answer. Some credit could still be gained if any correct conversion to a decimal had been given.

Question 15
Incorrect order of operation resulted in many candidates gaining no marks. Those who worked out the value of the denominator and then divided it into 2.59 usually completed the calculation correctly.

A significant number of candidates got $\frac{2.59}{1.75}$ and then proceeded to divide 1.75 by 2.59.

Question 16
The most popular method here was to convert both given fractions to decimals before comparing. This was usually successful. Attempts to convert to equivalent fractions whilst often successful, did often fail also owing to different denominators. Attempts at using diagrams usually failed as most candidates here sketched shapes of completely different sizes.

Question 17
Part (a) was usually well done, but answers of 14:6 and 3:7 were common.

In part (b) very few were able to find a method to solve this problem. An answer of 3 was the most common incorrect answer usually coming from an attempt to subtract the ratio 4:1 from 7:3

The few that did try to divide (20 – 5) in the ratio 4:1 usually went no further.

Question 18
The vast majority of candidates were aware of the concept of tessellating shapes and were able to score well here.

Question 19
In this question, many candidates were confused by the interior and exterior angles given and often simply subtracted the sum of the 3 given angles from 360.

Many correctly found angle CBE (=35°) and then offered this as their value for x. Having arrived at a correct answer of $x = 145°$, many candidates were unable to give acceptable reasons for their geometry used. Centres should note what are acceptable reasons in these situations from the notes in published mark schemes.

Question 20
Many candidates read this question as "20% off 450" and gave answers of 360. Most candidates however where able to find 20% of a quantity.

Question 21
This was very disappointing. Many candidates found the volume of the cuboid and gained no marks. Many correctly found the area of each end (3 × 2) but then assumed the remaining 4 faces were identical and worked out either 4 lots of 15 or more usually 4 lots of 10.

Question 22
Inequalities represented on number lines, appears to be not understood by very many candidates. This may have been an omission in preparation by some centres.

In part (a), $x < 5$ or 6 or $x \leq 5$ or 6 were often seen.

In part (b), a line between -1 and 3 was often seen but not as often including the correct inequality notation.

Question 23
In this question, many candidates ignored the parallel lines completely and assumed that angles ACP and QCD where equal to a half of 180 – 76. This method resulted in no marks at all. Of the successful approaches the most popular was recognising angle QCD to be corresponding to the 54o angle, however very few were able to explain this when asked for their reason.

Question 24
Being given the formula should have helped greatly here but many interpreted it as $(\pi \times 6)2 \times 8$ or $\pi 2 \times 6 \times 8$

Question 25
For those candidates understanding the concept of inequalities, this question offered 2 less demanding marks. The greater majority however simply gave examples of numbers greater than 12 in part (a) and less than 20 in part (b).

Question 26
Very few candidates indeed gained full marks in this question. Use of Pythagoras was poor and often, even when used correctly, inability to find the area of a triangle prevented total success.

Question 27
Many candidates were able to see from the diagram how 4x + 6 had been determined in part (a), and thus gain some credit. Many however simply left their expression in their solution without relating it algebraically to the given D. In part (b), correct manipulation of the formula was rare; many making good first steps, subtracting 6 or dividing by 4, but then failing to complete the transformation of the formula.

Question 28
Only a very few were able to successfully solve this problem. The majority of candidates attempted to find area rather than perimeter. Of those who did try to find the perimeter of the shaded shape, few considered the two straight edges when giving their final answer.

Grade Boundaries

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