Principal Examiner Feedback

Summer 2013

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

Foundation (Non Calculator) Paper 1F

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GCSE Mathematics 5MM1F
Principal Examiner Feedback – Foundation Paper Unit 1

Introduction
Candidates appeared to find the paper accessible; there was evidence of good work throughout the paper.

Arithmetic continues to be an area of weakness for some candidates. This was particularly evident in Q5, Q12 and Q21

Good responses were seen to the questions testing quality of written communication with the majority of candidates showing sufficient working and, where appropriate, a conclusion.

Candidates at this level remain reluctant to use algebraic techniques in problem solving. This was particularly evident in question 28 where trial and improvement was the common chosen method of solution from those who attempted the question.

Report on individual questions

Question 1
The first two parts of this question were well answered. There were a surprising number of blank responses in part (c) with 80 000 being the most popular incorrect answer. Candidates had the most trouble with part (d) where 4 or 4.0 was a common incorrect answer.

Question 2
Part (a) was invariably correct. The majority of candidates also wrote the decimal numbers in (b) in the correct order, of the errors seen most came from confusion regarding the correct order of 5.06 and 5.6

Question 3
Candidates demonstrated a good understanding of the language of probability. The most incorrect answers were seen in part (c) with even being the most common wrong answers but this was only from a very small minority of candidates.

Question 4
When asked to identify types of angles on a diagram, candidates must ensure that this is done unambiguously. There were occasions where the letter A was placed on the intersection of two straight lines rather than in an acute angle. When this occurred, no mark could be awarded.

Question 5
Part (a) was well done.

In part (b) many candidates failed to 'borrow' in order to subtract the 0.37 from 0.6 and so gave an incorrect answer of 11.37.

The decimal place caused problems in part (c) with 12.32 being a common incorrect answer.

Those who drew and used a number line in part (d) were generally more successful in obtaining an answer of 2 than those who did not. Common incorrect answers were 16 and −16.

Unsurprisingly, 30 was a popular incorrect answer in part (e) although a number of candidates demonstrated a lack of knowledge of their tables as well as being unable to deal with multiplying a positive by a negative number with, for example, 18, 25, 20 and 24 frequently seen as an answer.

Question 6
In part (a) the most popular correct answer was to shade the square that then created a rectangle from the given diagram.

In part (b) candidates often chose to shade the square that turned the given diagram into an upside down 'T' shape.

Question 7
Those who understood how to tackle the question realised that they had to get the two numbers into the correct format. Most errors came from those candidates who attempted to turn the fraction into a decimal with 2.5 being a common incorrect decimal.

A few candidates used the argument that $\frac{2}{5}$ is less than 0.5 and 0.6 is greater than 0.5 successfully. The majority of candidates showed their working clearly and gave a statement as a conclusion but there were still some who simply circled their chosen number and therefore failed to gain the communication mark.

Question 8
The majority of candidates were able to identify at least one triangle correctly.

Question 9
These candidates who realised that they had to continue the given sequences generally gained full marks. 15 were the most commonly given correct answer but 21 and 27 were also seen. A significant number of candidates did not realise that they had to continue the sequence and just used the numbers already given to come up with the answer 3 or 9 and thus gained no marks.

Question 10
This question was testing the candidates' understanding of order of operations and brackets.

In part (a) as the operations were presented 'in the correct order' the majority of candidates gave the correct order although a significant minority were unable to provide the correct answer to the division of 12 by 4.

Fewer errors were seen in part (b).

In part (c) the most common answer was the incorrect 28 from candidates who used the wrong order of operations. A significant number of candidates started correctly with the multiplication but then carried out the subtraction in the wrong order thus ending with an answer of −8 rather than 8

Question 11
The first two parts were well answered. In part (iii) many gave a factor rather than a multiple of 12. The most errors were seen in the final part of the question with many candidates unable to identify 16 as the square number.

Question 12
The word 'product' caused problems for a significant number of candidates. While many interpreted this incorrectly as addition, others just left out that calculation. Poor arithmetic skills, particularly when attempting $57 - 29$ meant that many who knew what to do failed to gain full marks.

Question 13
It was rare to see wrong coordinates in part (a). In part (b) plotting at (1, -2) and (-2, -1) were common errors.

Question 14
Part (a) was reasonably well done but there was considerable less success in part (b) where writing the reciprocal of the given fraction was a relatively common error.

In part (c) the most common answer was the incorrect $\frac{5}{12}$ from those candidates who simply added the numerators and denominators of the given fractions. Those who understood that a common denominator was needed generally gained full marks.

Question 15
Part (a) was almost always correct.

In part (b) the most common method was to cite the reason as 'all numbers in the sequence are odd but 200 is even' or similar. Some candidates did use the nth term to show that for 200 to be in the sequence n would be non-integer. 'Because it goes up in fours' was not an acceptable answer unless this was expanded to explain that the sequence started on an odd number and adding four meant that all numbers in the sequence would be odd. Some candidates incorrectly described even numbers as "whole numbers".

Question 16
Part (a) was well done.

In part (b) it was common to see pairs repeated or, occasionally, apple, apple given as a possible combination.

Question 17
Parts (a) and (b) were generally well done.

It was usual to see 7a as part of the answer in part (c) but errors were frequently made which mean that the coefficient of b was often incorrect.

Question 18
In part (a) the majority of candidates concluded that the spinner was biased because it landed on A and B more often than landing on the other numbers.

Despite being given the total frequency of 40 in the question, a significant number of students added up the frequencies from the table and came up with an incorrect total frequency and thus an incorrect denominator $\frac{2}{5}$ was a common incorrect answer. Some candidates did answer with the word 'unlikely' rather than giving a fraction.

Question 19
Many correct answers were seen in part (a), the occasional 18 was seen from candidates who subtracted rather than divided by 7.

In part (b) the most common incorrect answer was 6 from candidates who carried out the subtraction in the wrong order.

In part (c) those who employed a correct method, either algebraic of a reverse flow chart, generally gained full marks. When it came to factorising, relatively few candidates understood the need to put in brackets. The majority of those who did generally gained full marks; it was rare to see a partially factorised answer.

Question 20

One approach was to work out the length of one side of the square and then multiply by 12; this approach was the one most commonly used by those candidates who got the correct answer. Many counted the number of squares in the diagram and therefore just multiplied the given perimeter by 5 failing to realise that this did not give the correct answer due to some duplication and not all sides being on the perimeter of the given shape.

Question 21

The majority of correct answers came from candidates either using the 'grid' method or the 'traditional' method for long multiplication. Those who partitioned the number into 400, 20 and 7 multiplied by 50 and 6 frequently made errors in their multiplication particularly with 400×50 and 20×50. In all methods it was 6×7 that was evaluated incorrectly most frequently.

Question 22

Part (a) was well done. In part (b) candidates frequently had trouble in enlarging the sloping sides of the triangle. Other candidates did not understand how to produce an enlargement.

Question 23

Many fully correct Venn diagrams seen.

From these candidates, the answer to part (b) was then frequently incorrect. The common error in the Venn diagram was the omission of 32, 43, 38 and 40. Some candidates failed to put 33 and 39 in the intersection with these numbers being placed in both A and B.

Question 24

Those candidates who started by drawing up a table of values generally went on to gain full marks. However, there were many blank responses for this question.

Part (b) was well answered by those who had a correct graph in (a). Most substituted x into the given equation and showed that this gave a value of 23 for y rather than the given 24. Others started with 24 and worked backwards to show that this did not result in a value of x = 6.

Question 25

Throughout the question many candidates worked out the answer from scratch rather than using the given information. Unfortunately, many who used this approach made errors in their multiplication (often related to relative place value) and therefore failed to score.

From those who used the given information, 84.32 was a common incorrect answer to part (b).

Question 26

Those who draw up a sample space or made a list of all the possible outcomes generally scored full marks although $\dfrac{5}{24}$ was a common incorrect answer in (ii) from those who included a score of 5 in their list.

Candidates who just wrote out (5,7) in (I) and then the correct four pairs in (ii) frequently had the wrong denominator, 10 being a common incorrect choice.

Question 27

The most common error was to use 4 × 4 rather than $\dfrac{1}{2} \times 4 \times 4$ for the area of the small triangle although many candidates had difficulty in splitting up the shape in an appropriate way. In questions like this, candidates would be well advised to show, on the diagram, how they are partitioning the shape.

There was an independent mark for the correct units of cm^2 but these were frequently omitted or given as cm. A significant number of candidates multiplied three lengths together suggesting that they were somehow attempting to work with volume. It was not uncommon to see the perimeter being attempted.

Question 28

There were some fully correct responses to this question but these were few and far between with many blank responses. Some candidates started correctly by adding together the three expressions but then failed to equate this sum to 180 (equating to 360 was a common error) and so failed to make further progress. Many students also simplified expressions such as "4x + 8" as "12x" not realising that they can only collect like terms.

Grade Boundaries

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