Pearson Edexcel

Examiners' Report
Principal Examiner Feedback

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Pearson Edexcel International GCSE
Mathematics A (4MA1)
Paper 1F

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International GCSE Mathematics
4MA1 1F
Principal Examiner's Report

Students who were well prepared for this paper were able to make a good attempt at all questions. It was encouraging to see many students clearly showing their working. Writing down the number of edges of a 3D shape, using everyday mathematics and finding percentages were some topics that some students found challenging.

On the whole, working was shown and was easy to follow through. There were some instances where students failed to read the question properly. For example, in Q11, some students did not answer the question but interpreted the ratio incorrectly.

A striking weakness in students was solving problems with scale drawings, ratio, applying simple trigonometry and working out problems involving ratios and percentages. On the whole, problem solving questions and questions assessing mathematical reasoning were not tackled well, this was particularly apparent in questions 6, 7d, 9, 13, 17 and 19

Comments on individual questions

Question 1

This question was answered well by almost all students.

On part (d) some students wrote down 1 + 2 or 2 + 9 assuming that 1 or 9 were prime numbers. Some students gave their answers as products.

Question 2

This question was answered well by almost all students.

On part (d), of those that didn't answer this part incorrectly, the most common error was to draw a bar at 320

Question 3

This four-mark geometry question gave a good spread of marks.

There were many interesting ways of spelling reflex, radius and pentagon, however, marks were awarded as long as the meaning was clear.

In part (d), many students wrote down the correct value of the number of edges of the sold prism, however, students are still getting confused with the number of faces and/or vertices.

Question 4

In parts (a) and (b), most students were able to write the correct coordinates, however, a common error was to write the coordinates the wrong way around.

In part (c), many students were able to plot the midpoint correctly. A common error was to plot the point at (2.5, 1)

In part (d), most of the students plotted the point correctly and showed a correct drawing of a kite. A few plotted crosses in various places on the grid and often did not join up to see if the shape looked correct. A suggestion would be, if a certain shape is to be made, join the points and make sure it does look like the shape required.

Part (e) was not answered well. Common incorrect answers given were 2 and 4

Question 5

A majority of students were able to shade in $\frac{2}{3}$ of the shape and write $\frac{3}{10}$ as a percentage for parts (a) and (b) respectively.

Part (c) was well answered as many students gave an answer of $\frac{8}{25}$. Some students wrote down an answer that was not in its simplest form, for example, $\frac{24}{75}$ etc

In part (d), writing $\frac{46}{7}$ as a mixed number was straightforward for many, but commonly seen was a decimal answer.

Question 6

Questions involving change still cause problems for students. Many students worked out the total cost of the chicken makhani and/or the total cost of the vegetable korma thereby gaining the first method mark. Many students added up the two values, 291 and 330, and subtracted the sum from 1000. A common error was to subtract 145.5(0) and 110 from 1000.

The more able students were able to divide 379 by 30 to find 12.6333… or repeated addition was used often with 30 to reach 360 or 390.

12.63 or 12 as a final answer was very common.

Many students did not subtract 360 from 379 to find the final answer of 19

Question 7

(a) Many students gave a correct answer of 45*dc*

(b) Collecting like terms was well done, although the directed number aspect is still an issue for some. The most commonly seen error was simplifying to 2*p* + 8*n* or 10*pn*.

(c) This part was well answered. Many students could multiply 8 by 9 and multiply 6 by 5 and obtain 72 and 40 respectively which gained the first mark. A common error was to add 72 and 40 and write for example 102. Some students did not recognise implicit multiplication and calculated 89 – 65. Students can use a calculator to subtract their numbers.

(d) A large majority could solve the equation, with an algebraic method seen regularly. Clear algebraic working was not required and there were many who did not write any algebra at all,

this could still gain full marks if done correctly. A noticeable common error was to write $5m = 17 - 6$ rather than $5m = 17 + 6$ scoring no marks.

Question 8

This question was done well. Most students were able to write down all the possible combinations from the *AEPW*. A common mistake by some students was to write down the correct combinations and then continue writing out combinations in different orders, e.g. (*A*, *E*) and (*E*, *A*)

Question 9

This question was a good discriminator in terms of the spread of marks. Less able students could work out the size of angle *ECD* as 64. The weaker students added 42 to 296 and then subtracted the total from 360 thus losing all the marks in the question.

Some students who worked out 64 then went to work out the size of angle *CED* knowing that angles in a triangle add up to 180. It was encouraging to see weaker students score 2 marks at this stage. A common error was to add 42 to 74 and then subtract the total from 180 assuming angles on a straight line add to 180 that included angle *CDE*.

Only the more able students worked out the value of *x* and it was encouraging to see many students write out their method clearly.

Question 10

(a) Generally, this part was answered well. Some students wrote down the answer as 18 rather than 3 and no credit was given for this.

(b) The majority of students gave the correct answer to this question. Of those that didn't, the most common error was for students to find the products correctly but then divide by the sum of the number of rewards (15) rather than the sum of the frequencies (50) which was given in the question. The other error was to divide the sum of the number of stars by 6. A common arithmetic error was to evaluate 0×3 as 3 rather than 0.

(c) This part was answered well. It was quite interesting to see some students scoring 2 marks for this part and scoring zero marks in parts (a) and (b). A common incorrect answer seen was $\frac{23}{114}$

Question 11

A majority of the students attempted the question. Credit was also given to students who misinterpreted the ratio. The students had to find the total number of vans for the first method mark interpreting that 3 parts of the ratio represented the number of cars. Students who worked out that there were 600 vans went onto find the number of electric cars (160) and the number of electric vans (216). Finding 160 and 216 scored 3 marks. Some students at this stage did not find the difference between the number of electric cars and the number of electric vans so losing the final 2 marks.

Students who misinterpreted the ratio by finding $\frac{3}{8}$ of 360 (= 135) and $\frac{5}{8}$ of 360 (= 225) still had the opportunity to score 3 marks. There were a number of students who worked out $\frac{3}{8}$ of 135 (= 60) and 0.36 × 225 (= 81) and then found the difference.

Question 12

There was a mix of blank responses and fully correct responses for this question. For those who attempted the question, a fully correct graph was often seen. Although it's disappointing to see a number of students who plot the correct points and don't put a line through them. A few students made errors such as wrongly plotting one of the points, but these were generally able to gain 2 marks for a correct line through at least three of the correct points. A small minority gained just one mark for a line drawn with a negative gradient going through (0, 5) or for a line in the wrong place, but with the correct gradient. Some students did not extend their lines through the full range of values specified, losing one mark as a result.

Question 13

Students found this question challenging. Some students converted 1750 m to 175 000 cm thus scoring one mark; however, many students either performed no conversion or assumed that there were 1000 cm in 1 metre. Most of these students went on to divide 175 000 by 160 and then lost the final 3 marks. Students did not realise that they had to work out the circumference of the wheel and then divide this value into 175 000. Some students simply worked out the circumference and then multiplied their answer by 1750 or 175 000 scoring only one mark.

Question 14

Part (a) was not answered well. Students still have difficulty finding a bearing. Common incorrect answers were 60 or 300

Part (b) was answered well. Many students worked out the length to be 8 cm and then correctly multiplied by 4.5 to get 36.

Question 15

This is the first question of the common questions on both papers.

Generally, students at this level find interpreting Venn diagrams challenging.

In part (a), some students could interpret the set *A* but some gave an incorrect answer of 7, 9, 11 and 13.

It was disappointing to see students could not interpret the sets $A \cap B$ and $(A \cup B)'$ in parts (b) and (c) respectively.

Question 16

In part (a) the correct fully simplified expression was seen but so was a correct partially factorised expression. A relatively common incorrect answer was $30p^2q$ (or a variation on this) from those who presumably did not understand the term 'factorise'.

Part (b) was a challenging question for students at this level. Some students omitted the y gold bars to form $3y + 7 + 2y - 5 = 56$ and then went on to find 16.6 or 17 zinc bars. Credit was given to some of the students who followed this route. A majority of students, having been given the total of 56, attempted trial and improvement methods, substituting numbers into the expressions in order to try to get a total of 56 when added. Some students often attempted to multiply $(3y + 7)$ by $(2y - 5)$. Another incorrect method was to equate each expression to 56 and find various values for y.

Students are encouraged to use algebraic methods for these types of questions as they are directed to in the question.

Question 17

Many students worked out $1500 + (36 \times 450)$ to find 17 700 scoring one mark. Some went on to subtract 12 500 from 17 700 to find the profit of 5200 to score the second mark and then could not work out the percentage profit.

Some common errors were to write $\frac{12\,500}{17\,700}$ or $\frac{5200}{17\,700}$ thus leading to an incorrect answer. Others, with the correct approach, stopped with an answer of 141.6 or 1.416 as they failed to realise what was meant by a percentage increase.

Question 18

(a) Many students understood that the probabilities should add to 1 and were able to subtract 0.58 to find 0.42 but then this was commonly divided by 2 rather than 3. Those who did manage to divide by 3 often got an answer of 0.14. Some failed to note the decimal point and divided 42 by 3, without noting that this was then a percentage. The incorrect method of $3 - 2 - 0.58$ was not rewarded with a mark.

(b) Generally, this part of the question was not answered well. Only a minority of students gave the correct answer of 145 with working shown. Some students divided 250 by 0.58. As the wording of the question mentioned "estimate", some rounded 0.58 to 0.6 and then found 150 from 0.6×250, no credit was given for this. Students are encouraged to read the question carefully. Students should know the difference between when a number is required and when a probability is asked for, and not offer answers such as $\frac{145}{250}$

Question 19

This was an unfamiliar type of question but even so it was not answered as well as might have been expected. Many students recognised that the question required them to find the radius or diameter of only one of the circles as they were identical. Some students at this stage simply divided 20 by 3 to obtain an incorrect radius. Many students worked out the circumference of

a whole circle, 62.8, and then divided by 2 to find the circumference of the semi-circle, 31.4, and then multiplied by 3 and then added 20 to find the correct answer of 114.
Some students misinterpreted the question by finding the circumference of the circle and then multiplying by 3 and then adding 20 or finding the circumference of the semi-circle and adding 20 and then multiplying by 3. Some students found the circumference of the semicircle, multiplied it by 3 and then failed to add on the 20 and so lost 2 out of the 3 marks.

The less able students went down a wrong path by attempting to work out the area of circles or semicircles.

Question 20

This was a slightly different question from previous series as the idea of reverse percentages was applied twice to different values involving a fraction and a percentage. Students answered this question in two different ways – those who used the correct method of division by $\frac{5}{6}$ or 0.8, or those who used the incorrect method of multiplication by $\frac{5}{6}$ or 0.8. Careful reading of the question would help students realise that $\frac{1}{6}$ is a fraction of the original (normal) price and not $\frac{1}{6}$ of the given (sale) cost of ticket A. Likewise 20% is a percentage of the original price and not 20% of the given cost of ticket B. Many students made the familiar mistake of simply finding $\frac{1}{6}$ or 20% of the sale ticket prices and then subtracting or adding these values from/to the price of the given tickets. More students could do the reverse percentage than could interpret the fraction.

Question 21

Most students struggled to access this question. Very few students realised the relationship between prime factors and the HCF. Many confused the two skills and some stated the multiple as the factor and vice versa, confused by the terms "lowest" and "highest". At this level the numbers chosen for this problem also hindered candidates further. Not many students tried to find factor pairs.

Question 22

(a) As we expected, only the most able students sitting this paper were able to gain full marks on this question. Students who gained one mark could separate the x term on one side and the numbers on the other side. These students could rearrange to obtain $5x \geq -6$ then divided by 5. Many fell at the final hurdle and gave an answer of $x \leq -\frac{6}{5}$ instead of $x \geq -\frac{6}{5}$

(b) There was evidence of x and y being confused in answers to this question. Similarly, the wrong inequality signs were often seen with = used instead of the correct $\geq$ and vice versa. In particular, students could not use pairs of inequality signs, so attempts such as $2 < y < 7$ or $2 < x < 7$ were seen. Incorrect values were occasionally read from the axes with -7 being used in place of 7 when writing down the inequalities in x being the most common of this type of

error. For those that failed to score at all, the most common incorrect answer seen was just a list of coordinates with a complete failure to engage with the concept of boundary lines.

Question 23

Parts (a) and (b) were answered well by the more able students. Common incorrect answers seen were 58 700 and 8.4×10^{-7}

Part (c) was generally answered poorly, and many students could not arrive at the answer of 57.8. There were many students who wrote out each number as an ordinary number with some missing some zeros resulting in 5.78 or 578 which gained zero marks. Common errors included dividing the numbers the wrong way round or multiplying them.

Question 24

As expected, only the most able students could answer this question. A minority of students could use trigonometry to find the length from *A* to the of the base of the perpendicular line from *C*. The more able students then worked out the length from *B* to the foot of the perpendicular by subtracting 9.53 from 22 and obtaining 12.5 thus gaining 3 marks.

Some students at this stage worked out the length of *AC* and then got into a tangle of how to find the value of angle *x*, by wrongly assuming angle *ACB* was a right angle.

In most cases students used a variety of unnecessary methods such as Pythagoras theorem to find the value of *x*.

Summary

Based on their performance in this paper, students should:

- learn angles in a triangle add up to 180°
- use a protractor to find the bearing on a scale drawing
- learn to set up algebraic expressions and equations
- learn when and how to apply simple trigonometry
- show clear working when answering problem solving questions
- read the question carefully and review their answer to ensure that the question set is the one that has been answered
- make sure that their working is to a sufficient degree of accuracy that does not affect the required accuracy of the answer.

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