Examiners' Report/
Principal Examiner Feedback

Summer 2013

International GCSE Mathematics A
(4MA0) Paper 2F

Level 1/Level 2 Certificate in Mathematics
(KMA0) Paper 2F

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General comments

Students were able to carry out standard tasks in a competent manner. Responses to equations, expanding brackets, frequency table calculations, factor trees and fractions were pleasing. Students found the questions on ratio, pie charts and speed more challenging. Generally, good use was made of calculators.

Question 1

Most, but not all of the students could identify the 30% in part (a)(i). Alternatives offered included 3 and either $\frac{3}{10}$ or 0.3. Part (a)(ii) proved to be more successful with more students opting for the correct percentage.

Part (b) proved to be challenge for some students. There appeared to be no consistency in the incorrect answers seen.

Question 2

In part (a), most students were able to identify the correct value indicated on the number line. There was no consistency in the incorrect answers seen. Similarly on (b)(i), most students were able to locate the correct place on the number line but there appeared to be no consistency in the incorrect responses seen. Students generally did well on part (b)(ii), although a few wrote down 3.8 or 3.80 instead of the correct 4. Part (b)(iii) proved more of a challenge with many students opting for 'tens' or even 'units' However, part (c) was very competently answered.

Question 3

Students were generally able to provide correct answers to parts (i) and (ii). Amongst the incorrect responses seen, it was more frequent for candidates to indicate too high a probability, rather than too low. Some students did not identify the respective probabilities, only putting unlabelled crosses on the lines, or confused or even duplicated their letters. In questions of this style, it is important that candidates label their responses.

Question 4

Virtually everyone got parts (a), (b)(i) and (b)(ii) correct. The success rate on part (b)(iii) was not quite so high, with some students being unable to deal with the fractional part.

In part (c) most students were able to write down the fraction $\frac{10}{24}$ followed in many cases by $\frac{5}{12}$. Some thought the fraction was $\frac{10}{14}$ or $\frac{24}{10}$. Others wrote down ratios instead of fractions.

Question 5

Both parts (a) and (b) were well answered with most students having the correct equipment and the ability to use it. In part (c)(i) many students were able to state the correct answer of 'radius' but there was considerably less success for part (c)(ii)

Question 6
Most students were able to draw a correct diagram for part (a). In part (b) the correct answer of 31 obtained from $6 \times 5 + 1$ was often seen. Some students drew the pattern for number 6 but only got the marks if they wrote down the correct number of sticks. In part (c) many students were able to write down the answer without any working. Correct answers were also seen where the student had drawn pattern number 12 and counted the total number of sticks. However, many students were confused here and gave an answer of 306 from $5 \times 61 + 1$. Answers in which the 12 was given embedded such as $12 \times 5 + 1$ were given 1 mark unless the 12 was also written on the answer line.

Question 7
Most students were able to identify 'Cardiff'. Of those that did not score the mark, the majority wrote 'Edinburgh' (which does have the lowest number ignoring signs). There were many successful answers to part (b). Most students wrote down -3 - 5 or just put -8 on the answer line.

Question 8
In part (a), many students used their calculators to work our $25 \div 3.95$ rounding their answers down to 6. Others used their calculators to multiply by numbers until they got answers close to £25 and settled on 6 that way. Students who adopted an 'adding up approach' to get close to £25 had to end up with the correct total of £23.70 for any marks. For part (b), most students used the monetary value they had found to part (a), to work out the change. Many students using wrote down the display of 1.3 instead of using correct monetary notation of (£)1.30 or even (£)1.30p. Others knew that they had two figures after the decimal point, so wrote 1.03.

Question 9
Completely correct answers to all parts tended to be a rarity. On (a), many students marked lines that were parallel or did not mark any line at all. There were better answers to part (b), but it was common to see the right angle marked as obtuse. Part (c) was generally well answered but the quality of responses to (d) was poor with many blanks or with the length of PQ or its extent written down. In part (e), most students were able to attempt to find the area although some left off the units or gave the wrong units.

Question 10
Many students were able to give correct answers to part (a), with only a minority writing, for example t^3. For students who understand the concept of an equation part (b)(i) proved relatively straightforward. However, many students did not and wrote down answers which came from some combination of the 8, 3 and 9.

Part (b)(ii) was a question where students had to demonstrate understanding and use of balancing when solving a linear equation. A correct solution found by either trial and error or without any algebraic working scored no marks. One possible convincing solution was to write $7y - 2y = 6 + 8$ followed by $5y = 14$ and then $y = 2.8$ Many students did do this or something very similar.

Part (c) was more challenging than (a) and (b), but many students had been prepared well to write down all 4 terms, so that even if the signs were wrong they scored a mark.

Question 11
Part (a) was generally answered well with many students getting the correct answer of \$630. There was a significant minority who divided rather than multiplied to give an answer of \$321. Success rates for part (b) were lower. Part (c), however, proved to be challenging with the answer of 140 or even 1.40 very common.

Question 12
This proved to be a challenging question. Most students knew they had to multiply 0.8 by 0.3 to get the area of the base. A few also knew that they had to divide 108 by 1000 to get the volume of water in m^3, but very few were able to do both and then reach the correct answer of 0.45 m.

Question 13
Both parts were found to be challenging. The most efficient method of dealing with part (a) was to divide 195 by 30 and then multiply the answer by ($)80. This was sometimes seen. More common was $80 \div 30$ with the answer multiplied by 195. This was less successful as very often the answer was inexact due to premature rounding. Other students looked at the diagram and saw it was relatively easy to assign $ to the sectors and so tried to build up to 195^o by suitable combinations of other sectors. A common one was $6 \times 30 + 15$ which was then transformed to $6 \times$ ($)80 + ($)30. In part (b) most students did not use a method that could be credited with any marks.

Question 14
Many students obtained full marks on part (a) by drawing the correct shape in the correct place. There were a significant number who placed the arrow 1 square to the left of its correct place, presumably starting their counting from the numbers on the *y* axis rather than the axis itself. Only a few students managed to get all 3 marks on part (b). Surprisingly sometimes the word 'rotation' or its equivalent was missing, but on other occasions words such as 'flip' or 'twist' were used. Note that 'turn' was not accepted as a suitable replacement for 'rotation'. Many students gave a response that was not a **single** transformation, usually consisting of two transformations - a rotation and a translation. These students gained no marks.

Question 15
Many students at this tier seemed to find ratios challenging, although some showed a promising start by dividing 15 by 5, but then stopped. A number of students multiplied 15 by 3 to get 45 litres of blue paint being used to make 15 litres of green.

Question 16
In part (a) some students were not aware that the sum of the probabilities of the 4 outcomes had to be 1. Of those that understood this fact, most went on to score both marks. It was not uncommon to see an attempt at the sum of the given probabilities divided by 3 or by 4. Most students could select and then add the correct two probabilities in part (b) to get the correct answer. A few tried to multiply the two probabilities and the answer $\frac{2}{4}$ was occasionally seen.

Question 17
There were very few students who scored full marks. Slightly more than half seemed to know the correct relationship between speed, distance and time and most either divided by 585 (minutes) only or divided by 9.45 instead of 9.75.

Question 18
There were many correct demonstrations on part (a). The majority of successful students changed the given fractions into denominators of 24 and obtained $\frac{1}{24}$ immediately. Some students opted for a denominator of 48. They had to show that $\frac{2}{48}$ cancelled to $\frac{1}{24}$.
Students who tried to use decimals got no marks. Some students erroneously thought that demonstrating the correct use of the calculator buttons was the way to show the answer.

In part (b) the most common approach of the successful students was the standard one of multiplying by the reciprocal of the second fraction. $\frac{5}{8}\times\frac{12}{7}$ followed by either $\frac{60}{56}$ or by correct cancelling gained the marks. Some students turned both of the original fractions into ones with the same denominator to give typically $\frac{15}{24}\div\frac{14}{24}=\frac{15}{14}$ and gained the marks, but this was rare. On this paper, many students did not attempt this part.

Question 19
Many students were able to find midpoints, multiply by the corresponding frequencies and sum to find an estimate for the total amount of money. An equal number of responses were seen using the upper end of each interval. Some went on to attempt to work out the mean once they had found their estimate. These students were not awarded the final mark.

Question 20
In part (a), students were expected to find the exact coordinates. A number of students could not get at least one of the coordinates correct and often the *y* value was wrong. Students seemed to have no idea of finding the mean of the two *x* coordinates and of the two *y* coordinates
.
Many students found part (b) difficult because they had to picture the right angled triangle and work out the length of two of the sides (2 for the height and 7 for the base). Those that could do this generally got full marks. Allowance was made for those who made a miscalculation for the base or height with 3 and 8 being quite common. They generally scored 2 marks. Students who worked out $\sqrt{4.1^2+8.2^2}$ were given no marks as were those who measured the length of the line and put down 7.3.

Question 21
Some students were able to isolate the correct prime factors by using either a factor tree or by using repeated division, although many were unaware of either process. Only a few thought that 1 was prime. Some students lost an easy mark by simply listing the prime factors as 2, 2, 3, 17 rather than the product $2\times2\times3\times17$.

Question 22
Many students multiplied the given length of 22 cm by the scale to get 550000 (cm), although very often the units were omitted. Most students knew they had to convert to km, but many divided by 1000 to get 550 km instead of by 100 (change to m) and then by 1000 to get the correct 5.5 km or more directly by 100000. A few students decided to multiply 22 by 25001, but many students had little idea what to do, often dividing 22 by 25000 or the other way round.

Question 23
Most students could not make any progress with part (a) as they were unfamiliar with how to handle the double inequality. Answers to part (b) were more successful, although some students were inaccurate with the end points and some omitted the number 0.

Grade Boundaries

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