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Examiners' Report/ Principal Examiner Feedback

Summer 2015

Pearson Edexcel International GCSE Mathematics A (4MA0) Paper 3HR

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Summer 2015
Publications Code UG042079

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Introduction

Good solutions were seen to all questions. The most able students performed well throughout the paper, including the more challenging questions towards the end of the paper. On questions where there is more than one step needed to get to the final solution, students would be well advised to keep full accuracy until the final answer.

Report on individual questions

Question 1

The common arithmetic in part (a) was to evaluate 2×0 as 2 rather than 0. The other more fundamental error was to divide by 6 rather than 84. In part (b) those who misread the question and either found the percentage of the 40 people who caught more than 2 fish or 2 or fewer fish gained the method mark provided the method was shown.

Question 2

The majority of students were able to provide the correct answer to part (a). Some divided 180 by 15 and therefore scored no marks. Whilst many correct answers were seen in part (b) there was also the usual confusion between exterior and interior angles with the interior angles clearly marked as 72^o rather than 108^o in a number of responses.

Question 3

This question was invariably answered correctly.

Question 4

The instruction in the question required students to show clear algebraic working. The vast majority of students obeyed this instruction and gained full marks. An occasional error was to go from the correct $10x = 3$ to an incorrect answer of $x = \frac{10}{3}$

Question 5

In part (a) the majority of students did give a single transformation although the wrong mirror line was sometimes given. Part (b) proved demanding for some, with the shape frequently drawn in the wrong orientation; a minority of students rotated 180^o about the origin rather than reflecting the shape in the given line. The shape in part (b) was generally enlarged by the correct scale factor but was frequently in the wrong position. A minority of students carried out an enlargement using a scale factor of $-\frac{1}{2}$ rather than $\frac{1}{2}$; this was treated as a misread and one mark awarded.

Question 6

Whilst many correct answers were seen, there were a significant number of students who started off with the correct operation of 6×165 but then failed to make further progress. A common error at this stage was to subtract 155 and then divide the answer by 6 rather than 5.

Question 7

This was a standard question requiring the straight forward application of Pythagoras's theorem; this question was very well done. A minority of students lost the final accuracy mark for jumping straight from $\sqrt{193}$ to an incorrectly rounded answer.

Question 8

Part (a) was invariably correct. One consistent error in part (b) was to put the negative sign with the 4 rather than with the 6, some did just take e out as a common factor for the first two terms and offered $e(e-2)-24$ as an answer which gained no marks.

Question 9

Students should be reminded to ensure that, when taking the square root of a fraction, it must be absolutely clear that the square root sign covers the whole fraction and not just the numerator of the fraction.

Question 10

There was some confusion between the LCM and HCF in part (a). Some students worked successfully with the numbers given as products of primes; other students worked with the numbers themselves. Part (b) was generally well done. Some students made the error of working with just the indices, writing $2+3-4=1$ and then giving a final answer of 1; unless this was interpreted correctly and used to write 8^1 or 8 or to derive the correct answer of 3, no mark could be awarded. A common incorrect answer from the correct $8 = 2^n$ was 4 from $8\div2$. Some students started by converting the given powers of 8 into powers of 2. Unfortunately, incorrect use of index laws let them down.

Question 11

A common error in setting up the equation was to double the area of the triangle rather than the area of the rectangle. The majority of students were able to show the correct method to solve their equation and then substitute their found value of x to find the area of the rectangle. Some did not read the question carefully enough and found the area of the triangle, whilst others just found the value of 'x' and stopped there.

Question 12

Many students performed well in this question, plotting points at the end of the interval and using the correct method to find the median. Common errors included plotting points at mid-interval rather than at the end of intervals and using 11 rather than 10.5 or 10 on the cumulative frequency axis to find the median. There were some instances seen of the scale being used incorrectly on both axes.

Question 13

Some students failed to read the requirement to give their answer in standard form in part (b) and therefore failed to gain the accuracy mark. Whilst many students gave the answer in part (c) as 7.5% or 0.075 or $\frac{3}{40}$ a significant number did give a ratio equivalent to 3:40 which was not acceptable as a proportion. Subtracting the two quantities was a common error in part (c).

Question 14
Those who solved the simultaneous equations using the standard method of elimination and substitution were generally more successful than those students who attempted to rearrange one equation and substitute for either x or y.

Question 15
The candidature was split between those who could reproduce the necessary algebraic proof to change a recurring decimal into a fraction and those that did not know where to start.

Question 16
Those who drew in the line of symmetry of the kite generally gained full marks although some did forget to double the area found for triangle ADC. Those who constructed two triangles by drawing in BD then erroneously assumed the sizes of various angles and so gained no marks.

Question 17
While a good number of fully correct responses were seen there were also a significant number of blank responses. In part (a), a common error was to add the probabilities $\frac{5}{12}$ and $\frac{n}{25}$ rather than multiply. In part (b) the common error was to fail to include all the various combinations.

Question 18
Finding the vector QX in part (b) proved the most demanding part in (a). Following an incorrect vector for QX some students were able to pick up a follow through mark in (ii) and (iii) and then occasionally in part (b) as well.

Question 19
Some students stopped in part (b) once they had found the value for the radius of the pond; others then found the area of the path rather than the area of the pond. Some students lost marks as they did not show working when using the quadratic formula, just arriving at the values. Whilst much correct algebra was seen in part (a), some students were less than clear in their working and very disorganised which made it difficult on occasion to follow methods through .A common error was to incorrectly expand the bracket $(r + 1.5)^2$

Question 20
In part (c) it was disappointing to see good students losing marks either for not reading the scales correctly (particularly the y axis scale) or for failing to appreciate that the tangent they had drawn had a negative gradient. A common incorrect method in part (c) was to use the coordinates at the point where $x = 3$, giving an answer of $-\frac{4}{3}$ directly from (3, 4).

Question 21

Some students who had some understanding of bounds failed to recognise that the denominator of the fraction had to be a minimum in order to produce the upper bound and so used 28.5 rather than 27.5. Others either showed no knowledge of bounds and simply used the numbers given in the question and gave 5.8, others went on from here to give the upper bound as 5.85

Question 22

Those who started by dividing terms in the denominator by 3 could only progress to gaining a mark for factorising the numerator. It was disappointing to see a significant number of students getting to the correct answer of $\frac{3x+5}{6x+9}$ and then carrying out further incorrect cancelling, for example, giving their final answer as $\frac{x+5}{2x+3}$, which lost them the final accuracy mark. Other students started off by carrying out incorrect cancelling and so gained no marks.

Question 23

Some very succinct solutions were seen. Other students employed the use of Pythagoras's Theorem and/or the cosine and sine rules to take a longer route, sometimes losing accuracy along the way. There was some confusion in this question as to which angle was the angle of elevation. A minority of students found the angle of elevation, angle *TAX*, but then gave angle *ATX* as their final answer, thus losing the final accuracy mark.

Summary

Based on their performance on this paper, students should:

- read the question carefully to ensure that the final answer is given in the required form
- ensure that sufficient working is shown in questions where this is specifically required by the question
- refrain from carrying our incorrect cancelling in algebraic fractions
- look carefully at scales in graphical questions and read these carefully
- maintain full accuracy on calculators and only round the final answer

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