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Examiners' Report
Principal Examiner Feedback

Summer 2017

Pearson Edexcel International GCSE
In Mathematics (4MA0) Paper 4HR

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Introduction to Paper 4HR
The paper performed as expected and was accessible to students at this tier. It included questions that differentiated appropriately and enabled students to demonstrate their ability across the assessment criteria.

Report on Individual Questions

Question 1
This question was answered very well by the majority of students. Some errors occurred because of premature rounding which caused the final answers to be slightly inaccurate. Different methods were seen, including 30/12 x 110 in part (a) and 375/100 x 12 in part (b).

Question 2
Most students seemed to have a grasp of set theory. Some confused part (a)(i) with (a)(ii) and others omitted 10 from their set C in part (b).

Question 3
A high proportion of students scored full marks in this question. Those who didn't often scored one mark for 102.66. Most were able to round their answer to part (a) correctly although some gave an answer of 14.3 or rounded to 3 decimal places. Many scored a follow through mark in part (b) even if their answer in (a) was incorrect.

Question 4
This was well answered with the vast majority correctly finding the volume of the cuboid, although some found the surface area. Most errors occurred when finding the volume of the triangular prism; many just multiplied its base by height by depth.

Question 5
A high proportion of students answered this question correctly. In part (c), some made a sign error while others simplified the four terms incorrectly. Occasionally, $3p$ was added to the left hand side of the equation in part (d) and some gave an answer of $3p^{15}$ in part (e).

Question 6
Most students answered this successfully. Some multiplied the end points by frequencies but they were still able to gain up to 2 marks if they also correctly divided the sum by 60. A few just added the midpoints and divided by 5.

Question 7
In part (a), the most common error was to give an answer of 3.5 rather than include the inequality. Part (b) was generally answered well although some students who chose not to use an arrow didn't draw their line long enough. Likewise, part (c) was usually answered correctly although 0 was sometimes omitted.

Question 8
This question was done well by most students. Only a very few misapplied Pythagoras' Theorem by squaring and adding. A small number of students used the rather inefficient method of using trigonometry to find an angle, and then finding the missing side. In such cases it was common for errors to be made.

Question 9
Many students were very familiar with this question. Some tried to use the Elimination method but applied the wrong operation. Others rearranged one of the equations and then substituted this into the other equation; those who attempted this method tended to be successful. Students who stated the correct values for x and y without working gained no credit.

Question 10
A very high proportion of students answered this question correctly. Occasionally, an answer of 220 000 000 was given in part (a) and 9.5×10^4 in part (b).

Question 11
Many students scored full marks, using an efficient method to find the value of the investment after three years. Errors included multiplying by 1.04 and then by 3. A few students decreased by 4% instead of increasing.

Question 12
Students who identified the need to find the gradient usually scored full marks in part (a). Most who were successful in part (a) then found the correct equation of the parallel line in part (b). Those who had an incorrect gradient in part (a) sometimes followed this through correctly to part (b).

Question 13
There were many available methods to find a missing angle or side; finding one of these was usually enough to score two marks. Many went wrong after this, with some treating *BDC* as if it were a right-angled triangle. Only a few students used the most efficient route which involved using 2 applications of basic trigonometry.

Question 14
Most students were able to score at least one mark although some failed to score if they multiplied the left hand side by 6 but not the right hand side. Many lost marks by expanding their brackets incorrectly although a high proportion of students who gained the second M1 then went on to score full marks.

Question 15
In part (a)(i), many identified the correct angle as 61°, although the most common incorrect answer was 53°. Very few students gave a correct reason in part (a)(ii) with some referring to alternate angles rather than alternate segments. In part (b), the majority of responses scored full marks, as most students were able to recognise *ABCD* as a cyclic quadrilateral.

Question 16
To score full marks in parts (a) and (b) needed students to recognise that the cards were not replaced. In part (a), a common incorrect answer was $\frac{2}{6}$ (two of the six cards had a number 4 on it). In part (b), many students identified at least one way of getting an even sum but some only considered one of (1,3) and (3,1) and so only scored one mark. A few students used a sample space method, which usually gain zero or three marks.

Question 17
Many students showed sufficient working and went on to score full marks but some scored zero marks because they showed no method at all. The most common errors involved the coefficient of x, which was -3. Some squared -3 incorrectly to get -9 while others gave $-b$ as -3.

Question 18
Fully correct solutions were regularly seen. Some used the correct relationship to find k but did not square 1.5 when finding the new value of A. Others treated the question as an inverse proportion problem.

Question 19
In part (a), many correct histograms were seen, often with little or no working. Some students just drew a bar chart indicating a lack of understanding that the area is proportional to frequency.

Likewise, in part (b), many correct answers were seen although some found $\frac{1}{3} \times 240 + 100$, not $\frac{2}{3} \times 240 + 100$.

Question 20
Parts (a) and (b) were accessible to most students although errors in (a) included 0 and 5. In part (c), students often scored at least one mark for finding f(-7). Some multiplied f(-7) by g(-7), rather than finding g($\frac{-1}{2}$). Part (d) was generally answered well. Some students made basic errors when rearranging, while others found the reciprocal of g(x) or left their answer in terms of y.

Question 21
Students who were familiar with vectors scored well in part (a). In part (b) some students gained one mark for correctly simplifying either vector $\overrightarrow{XY}$ or $\overrightarrow{YB}$ but only a small proportion offered a correct conclusion.

Question 22
Many students identified the correct triangle but were unable to make further progress. Those who did usually gained full marks by finding *MG*, and then correctly using trigonometry. Errors included identifying *BGH* as the relevant triangle while others found *MH* by dividing 15 by 2.

Question 23
Many students only scored one mark in this question for finding at least one correct bound. It was very common for students to use the lower bounds of v, u and a to find the lower bound of t. Some simply evaluated (27.3 – 18)/9.81 and then found a lower bound of this answer.

Question 24
Those who attempted to find angle *L* directly from the Cosine rule usually scored well. Some found angle *K* first and went on to find angle *L*. Others found only angle *K* and then correctly calculated the area of the triangle but then didn't make any more progress. A small number of students lost the accuracy mark for premature rounding.

Summary

- Some students would benefit from learning how to find the volume of a triangular prism.
- Students should be aware that when solving an inequality, full marks cannot be scored unless the final answer is given as an inequality
- Many students would benefit from learning the reason that corresponds to the Alternate Segment Theorem
- Some students attempted to apply basic trigonometry and Pythagoras' Theorem to non-right angled triangles
- Students who don't show working when using the Quadratic Formula will gain zero marks

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