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Examiners' Report/ Principal Examiner Feedback

January 2015

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

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Grade Boundaries

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The most able candidates performed well throughout the paper, including the more challenging questions towards the end and the vector question.

1 The vast majority of students scored full marks for this question. A few found that there was a difference of £112 between the two values but then added rather than subtracted this from £600

2 It was rare to see an incorrect answer in part (a). Part (b) was also well done although there were two errors that cropped up occasionally; the use of the diameter or radius rather than the circumference and the answer given in metres/min rather than the required metres/second. In part (c) those who could express the radius as $x - h$ generally went on to gain full marks.

3 A few students gave the size of angle *AXD* rather than the required angle *AXC*. A lot of detailed working correctly identifying each angle found was seen in the working space. Students who took this careful, organised approach generally went on to gain full marks. A small minority of students assumed that triangle *AXD* was an equilateral triangle and so gained no marks. It is essential in questions like this that, when working with angles, each angle found is clearly identified either using three letter angle notation in the working or by writing in the size of the angle on the diagram.

4 When an error occurred in this question it was usually from some careless arithmetic. This generally occurred when the given equations were subtracted with $2y - -y$ evaluated incorrectly as y which gave the common incorrect answers of $x = 9$ and $y = -3$.

5 Part (a) was well done. Most students gave their expressions in the correct form in part (b) in either the table or the answer line.

6 In part (a), '11 to 15', the group containing the median, was a common incorrect answer as was 20, the frequency of the modal group. Common errors in part (b) were to sum the frequencies and then divide by 6 or to use all the value at the ends of the intervals rather than the mid-interval values.

7 In was rare to see an incorrect answer in part (b). In part (a) a significant number of candidates substituted the values into the formula for the area of a trapezium correctly but then failed to obtain the correct answer to the calculation.

8 Not all students provided sufficient working in part (a) to make it clear how they had obtained the prime factors of 224. Some left their answer as a product of prime factors rather than as the product of powers of prime factors. Part (b) was generally well done.

9 This question was generally well done with students showing a good understanding of set language.

10 The most consistent error in this question was for students to find the length of *AE* rather than *DE* in part (b). Other students used the scale factor of 1.5 rather than 2.5 throughout the question. In part (c), whilst many used the efficient method of area scale factor to find the required area, some calculated missing lengths or angles and then found the required area; as long as accuracy was maintained throughout the solution such methods gained full marks. A significant number of students gave the area of triangle *ACE* rather than the area of the quadrilateral in part (c).

11 $2xy^3$ was a common incorrect answer in part (a). Part (b) was well done. When factorising expressions such as the one given in part (d) students should be reminded that numbers inside the brackets should be integer and not decimal values. Some students solved what they perceived to be an equation using part (d); if the correct factorisation was seen then marks could be awarded but some student simply used the quadratic formula and so gained no marks.

12 Some students did not read the question in part (a) carefully enough as, having found the correct answer, they did not then give their answer in standard form as required and so failed to gain the accuracy mark. The other common error in part (a) was to use 5800 rather than 5800^4 in their calculation. Part (b) was generally well answered.

13 On the whole, students gained either full marks or no marks for this question. Having said that, there were a few who, having failed to gain any marks in the first two parts of the question, both of which required algebraic expressions for answers, then went on to gain full marks in the final part of the question. Disappointingly, a number of students simplified $p \times p$ as $2p$ in part (b).

14 Another well answered questions. Students were split between those who saw the link between the two parts of the question and so were able to just write down the answer to (b) having answered (a) and those who started again from scratch. Some lost the final mark in part (a) by discarding the negative solution.

15 There were a fair number of blank responses for this question – certainly more than any other question. On the other hand, there were also a number of completely correct responses seen which suggested that some students may not have covered the necessary work on vectors. It was sometimes difficult in parts (b) and (c) to award method marks when the final answer was wrong as students did not always set their work out in a way that could be easily followed or interpreted.

16 Part (a) was generally well done. In part (b) many students were unable to interpret the given information correctly. The most common error here was to extend *AD* as well as *BC* and label the point of intersection of these lines as *T*. Those who made this fundamental error were unable to gain any marks as they were then trying to find the wrong angle.

17 Part (a) was well done. Students did not always show sufficient working in part (b); some answers clearly came straight from the use of a calculator as no understanding of how to rationalise a denominator was seen.

18 Those who were able to interpret the given information correctly and associate this with the appropriate area of the histogram generally went on to gain full marks. Some students made some attempt at answering the question and produced a mass of figures but, it was not always at all clear as to what the figures represented; it is incumbent on the student to ensure that they make their method of solution clear.

19 Most students were able to gain some marks in part (a). Some careless errors were seen in part (b) which meant that the answer of 2 rather than ½ was occasionally seen when this was accompanied by correct working then a method mark could usually be awarded but an unsupported answer of 2 gained no marks.

20 Part (a) was well done. Students who used $(4x^2 - 1)$ as a common denominator or multiplied throughout by $(4x^2 - 1)$ were more successful in their solution than those who used $(2x + 1)(4x^2 - 1)$. A significant number of students 'lost' a solution in the final

stages by dividing through by x rather than taking x out as a common factor. Others did find both solutions but then rejected the solution $x = 0$

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
- give all solutions to quadratic equations and only discard a negative solution or solution of zero when the context of a question makes this an inappropriate solution
- remember to take out x as a common factor when solving an equation for which x is a factor
- practice answering questions that involve the use of column vectors and the magnitude of a vector
- ensure they know the difference between an equation and an expression

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