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Examiners' Report/ Principal Examiner Feedback

Summer 2014

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

Paper 3HR

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Principal Examiner's Report

International GCSE Mathematics A

(Paper 4MA0-3HR)

Introduction to Paper 3HR

In general, the majority of students found this paper accessible and were able to demonstrate positive achievement; the most able gaining very high marks. Overall, students presented their work appropriately with clear and well-structured responses. Good use was made of calculators, but students would be well advised to keep full accuracy until the final answer.

Report on Individual Questions

Question 1

About half the students were able to get part (a) correct and then follow through these correct values to part (b) and also gain a correct answer in this part. Unfortunately, a common mistake was to include trailing zeros (e.g. 40.00) and students lost the mark in (a), although we allowed them to follow through to gain full marks in (b). Several students gave the values in (a) in standard form, which was given credit. Even though the instructions for (b) were to use the approximations in part (a), many students did not do this and gave the accurate answer rather than the approximation.

Question 2

Most students were able to correctly explain the meaning of the statement written in set notation in part (a). Part (b) was almost always correct. In part (c) many students missed out '9' but were able to give the other 3 members of set C, thus gaining 1 mark.

Question 3

In part (a), the ideal method to find the area of triangle AQB was to find the area of the rectangle and take away the area of the 3 right-angled triangles. Many able students went down a more complicated route and found the lengths of the three sides of the required triangle, then used sine rule to find an appropriate angle and then used the formula $\frac{1}{2}ab\text{Sin}C$ for the area.

Full credit was given to these students if they used unrounded values, but many forfeited the final (accuracy) mark due to slight inaccuracies. Some of the students using this method often lost marks by using the incorrect angle. There were a number who thought that AQB was a right angled triangle and found just two sides of the triangle – these students gained no marks.

Part (b) was answered very well by the vast majority of students who mostly gained full marks.

Question 4

For part (a), most students were able to give the modal class, although a few gave the frequency for the modal class.

Part (b) was answered well by the majority of students. A few multiplied the number of weeks by a consistent value from the range which was not the mid-point, gaining a method mark and a further mark for dividing by 52. Dividing by 6, the number of rows was a common mistake.

In (c), the term 'at least' seemed to confuse some students who were mostly able to give a fraction with 52 as the denominator (for which they gained 1 mark) but the correct numerator of 24 was rarely seen.

Question 5

In part (a), the majority of students were able to gain 2 marks for a correct answer, or 1 mark if they put a '−' instead of '+' in the brackets. A few had no idea what factorisation was and did some sort of collection of terms.

In part (b), the majority of students gained full marks. If 2 marks were not gained, then 1 was often given for x^2+7x+k or $...+7x+10$ or 3 correct terms out of a maximum of 4 when expanding.

Question 6

The majority of students gained full marks for this question, and if not, they generally picked up a method mark for expanding the bracket correctly.

Question 7

This question was fairly well done, but some students lost marks through rounding their answers to less than 3 significant figures in (a) or 1 decimal place in (b) as requested and showing insufficient working. Marks were also lost in part (a) by having the incorrect denominator of 133.3 instead of 87.3

Question 8

This question was very well done and generally students only lost marks if they used straight lines to join any or all of the points.

Question 9

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 full surface area and, as long as we could see the curved surface area as part of the working, they gained two of the three marks. A minority of students found the volume of the cylinder instead of the curved surface area.

Question 10

Part (a) was done well by most students but there were several students who didn't understand what they had to do to estimate the median or interquartile range. Some students used 140 as their total cumulative frequency and then gained incorrect answers for (b) and (c).

Question 11

Most were able to get part (a) correct, but in part (b) many students did not know what was required, although they were often able to gain a mark for a correct expression for $g(-3)$.

Again, in part (c) many students did not know what to do and even where they did, were unable to deal with the $(x+1)$ as the denominator of the function. A very common error was to substitute -2 into the function itself.

Part (d) was fairly well done by a lot of students. A few gave the answer with 'y' in the inverse, rather than 'x' for which they gained 2 marks.

Question 12

A lot of students gained full marks for this question, having a very good understanding of similarity. Part (d) was found to be the most challenging part of this question, where students failed to use the scale factor squared. It was nevertheless pleasing to see many correct answers here.

Question 13

This was quite well done by the majority of students who used a variety of methods to solve the simultaneous equations. The majority of students showed clear working, but if they did not, then no marks were awarded.

Question 14

The majority of students gained full marks for the differentiation in part (a). Unfortunately many students did not know what to do for part (b). Substituting $x=-\frac{3}{2}$ was frequently seen and some students made the $6x^2+6x$ equal to zero.

Question 15

There were many different methods used here to gain the correct answer, involving finding frequency or counting the number of "small squares" or "big squares". The mark scheme enabled students to gain method marks for all these different approaches if they involved some sort of area. The correct answer was frequently seen.

Question 16

Part (a) was generally well answered although a few students did not follow the instruction ‘show your working clearly’ and so gained no marks.

Part (b) was quite challenging, and only the most able students could find a sound method to find *q.*

Students were often able to pick up a method mark for this question either for rationalising the denominator or simplifying $\sqrt{8}$

Question 17

Part (a) was reasonably well done. Those that did not understand dependent probability tended to gain no marks in this part.

In part (b), students who calculated using ‘replacement’ probability could gain a maximum of 2 marks, but would not have been able to receive the final (accuracy) mark. Few students were able to gain full marks here, and a significant number did not realise that 2 x 50p coins was also one of the required combinations. The majority were able to gain M1 for one correct product.

Question 18

Part (a) was well answered with many full marks being gained. If students did not score full marks, they generally picked up a method mark for use of Pythagoras in a correct triangle from the 3-D shape. For the 2nd part of the question, it was clear that many students are more comfortable with finding angles between lines and planes when the plane is the base of a cuboid. Although many students used trigonometry, it was often for finding angle AFC, for which there were no marks awarded.

Question 19

Many students scored only 1 mark here for $x^2 < 16$, as they often continued to work with only $+4$. Of the students who did realise that the answer was ± 4, many were unable to write it correctly as an inequality.

Question 20

Some students understood what was needed with algebraic working and were able to give a fully correct answer. However, although many students were able to correctly state $n^2 = n + 6$ or equivalent to gain a method mark, they were then unable to continue to solve the equation or gain any further marks, often stating an answer of ‘3’ which appeared to have come from trial and improvement.

Question 21

More than half the students produced the correct answer for this question but those who didn’t were generally able to pick up a mark for a correct value of *AP*, *PB*, *OQ* or *QC*.

Grade Boundaries

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