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Examiners' Report/ Principal Examiner Feedback

January 2014

Pearson Edexcel International GCSE Mathematics B (4MB0) Paper 01

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There question paper performed well, with most candidates making reasonable attempts at most of the questions. Overall, the standard of presentation and clarity of work was high. However, it should be emphasized that candidates should be encouraged to include their working in the paper to show how they obtained their answers, since if an incorrect answer was given without any working shown, all of the associated marks would be lost. This is particularly important if the question requests the candidates to show all of their working.

Centres should emphasize to candidates the importance reading the demand of a question, thus for example, if the question requires a simplified answer, then that is what the candidate should leave as their final answer (questions 9, 16 and 19a).

For candidates who require additional sheets of paper to answer questions, candidates should be advised to indicate clearly in relevant the answer space in the examination booklet that their answer continues on a separate sheet.

It was pleasing to observe that many candidates showed that they have a good understanding of the basic techniques of arithmetic, algebra, geometry and trigonometry and were able to apply them competently. Centres should emphasize to candidates that they should give their answers to the required degree of accuracy, otherwise certain accuracy marks are lost. The question paper did, however, highlight the following areas that candidates seemed to find challenging, followed by their corresponding question numbers:

- Percentages (Q3)
- Number to specified precision (Q5)
- Expressions involving indices (Q8)
- Volume of a prism (Q14)
- Probability (Q15)
- Algebraic manipulation (Q16)
- Bearings (Q23)
- Inequalities (Q24b)
- Similar solids (Q27)
- Trigonometry (Q30c)

Question 1

In was pleasing to see many candidates answering this question correctly. Common errors in the method were to multiply 50 HK$ $\times$ 12.35 and to divide $\frac{12.35}{50}$, both of which scored no marks. A number of candidates, unfortunately, gave their answer rounded as £4, and this lost the accuracy mark.

Question 2

Many incorrect answers were caused by erroneous algebraic manipulation usually involving incorrect sign management (e.g $4x + 12 = 32$ instead of $4x - 12 = 32$) resulting in the loss of both marks. However, the large majority of candidates managed to collect full marks on this question.

Question 3

This was one of the discriminators of this paper. Many candidates incorrectly thought that 20% - 16% = 4% was the answer. Other popular errors were $\frac{16}{20}\times 100$ and $\frac{4}{20}\times 100$ both of which scored no marks.

Question 4

Many candidates calculated an angle that they called "x". Unfortunately, sometimes this angle was not specified thus usually resulting in the loss of potentially both marks. Some candidates thought that $\angle ABC = \angle BCA = \angle BCD$. Many candidates, though, successfully answered this question.

Question 5

Many incorrect answers of 0.0625 were seen for part (a) which scored no marks as candidates had failed to round to three decimal places. Where 0.0625 was followed by 6.25×10^{-2} as the answer for (b), candidates were allowed to pick up the mark for (b) provided it is correct standard form notation for *their* answer in (a).

The frequency with which 0.0625 was seen in paer (a) suggests that many candidates were unsure of the concept of decimal places in involving a number of the form 0.0…. Some candidates managed part (a) but were not sure what the standard form of their answer to (a) was. Another discriminator of the paper.

Question 6

Many correct answers were obtained for this question, however a number of candidates incorrectly thought that 15 was a member of the given universal set.

Question 7

Many candidates substituted 3 for x in the given expression and correctly found 0 as the value of the expression. Some erroneously substituted x = -3 into the expression, losing both marks. There were many incorrect attempts at long division usually resulting from sign errors.

Question 8

This question was less accessible to the weaker candidates, some of whom thought that the manipulation of the indices was a subtraction rather than a multiplication. Many candidates did not attempt this question at all, however, a fair number of candidates did manage to collect full marks.

Question 9

It was pleasing to see many fully correct attempts at this question. Of those who did not score full marks, most collected the method mark but then either carried on to refactorise their expression rather than simplify it as required, or forgot to square the y term in their final answer.

Question 10

Most candidates collected full marks but there was a significant number of candidates who unfortunately did not make any attempt at this geometry question. The number of non-responses indicates that it is a topic found challenging by a number of candidates.

Question 11

Many candidates knew what to do but were let down by their incorrect sign manipulation, thus losing the accuracy mark. Others were confused by the coordinates of the given point and mixed up their x and y coordinates, and thus lost both marks.

Question 12

Common errors seen were $\frac{2}{7}\times 420$ or $\frac{7}{5}\times 420$ resulting in the loss of both marks. Other erroneous methods started in a similar vein with $\frac{2}{7}\times(\textit{total weight})=420$ or $\frac{5}{7}\times(\textit{total weight})=420$. Despite these errors, many correct answers were seen.

Question 13

Many correct answers were seen, however there were a number of candidates who unfortunately forgot to note the number of each item bought and just added £1.25, 39p and £1.69 together. It is important to remind candidates to read the question carefully to avoid such errors.

Question 14

Another discriminator, with a number of less able candidates unable to attempt this question. Others, who were able to make a start, incorrectly thought that the volume was $2 \times 3 \times 5$ and not the area of ΔABC x 5 cm.

Question 15

Many thought that the answer for (a) was 0.9×0.04 but still managed to collect both marks for (b) as there were follow through marks available for candidates who calculated 1 - their answer to (a). Although most candidates collected full marks, there were a number who could not make any attempt at this question.

Question 16

The nature of responses seen to this question indicate that it is a topic found challenging by a candidates of various abilities. It presented few problems for the very able candidates. Less able candidates, though, were let down by their poor algebraic manipulation skills (normally involving a sign error) and often only managed to collect the first mark. A significant number of the candidates who gained the two method marks then let themselves down by failing to *simplify* their answer as required by the question.

Question 17

On the whole, this question was well answered by many candidates, however, there were a significant number who failed to collect the mark for (c) because they wrote down the *members* of the set rather than the *number* of members of the set as required by the question.

Question 18

In part (a), it was surprising to see that a number of candidates did not use the information given in the question, namely that 210^o represented the selling calls in the pie chart. Others did not realise that the question did not specify the number of delivery calls made, and thus thought that the answer was 420 + 160 + 64 = 644, losing the two marks. Most of the candidates who had obtained a correct answer in part (a) also collected the two marks available in part (b).

Question 19

It was clear that a number of candidates had difficulty in finding 4**A** – **3B** and thus failed to collect any marks for this part. In part (b), many candidates, however, were able to equate the relevant elements of their resulting matrix in (a) (even if incorrect) and thus managed to collect at least the available method mark.

Question 20

It was pleasing to see that the majority candidates have now mastered questions of this type; however there was still a number who have not. Candidates who had problems usually fell at the first step by setting $20 = k(2)^2$ or $20 = \frac{k}{2}$ resulting in the loss of all marks, whilst others failed to take the square root, but nevertheless often gained the first 2 marks.

Question 21

It is clear from the number of candidates who made poor attempts at this question that surds are a challenge to many candidates with the result that some candidates evaluated the given expression using their calculator and then tried to express their numerical answer in the form $a + b\sqrt{b}$ in the hope of thus finding the values of a and b. Unsurprisingly this was without success.

It was pleasing to see that the most able candidates have mastered surds and gained full marks for this question, lending itself as a good discriminating topic for the higher grades.

Question 22

Some candidates were unsure how to start in part (a) and as a result a number of non-responses were seen. Some thought that $\overrightarrow{AB} = \begin{pmatrix} 2\times 6 \\ 4\times 1 \end{pmatrix}$ or that $\overrightarrow{AB} = \begin{pmatrix} 2 \\ 4 \end{pmatrix} + \begin{pmatrix} 6 \\ 1 \end{pmatrix}$ or $\overrightarrow{AB} = \begin{pmatrix} 2 & 6 \\ 4 & 1 \end{pmatrix}$, all of which gained no marks. Usually, though, if a candidate had given a column vector as an answer to part (a), they were able to calculate the modulus of their vector gaining both the M and the A mark for part (b). It was pleasing to see that a sizeable number of candidates gained full marks for this question.

Question 23

It was noticed that a significant number of the cohort were unable to gain any marks for this question on bearings, with a variety of attempts seen. The topic of bearings is thus another discriminator of the paper. Of those that did gain marks, many usually collected the two marks for positioning and labelling *S* and *T* although some of these then went on to *calculate* the length in (c)(ii) rather than *measure* it as required by the question, which scored 0 marks as there was a scale given in the question.

Question 24

Many candidates were able to correctly write down the coordinates of *A* but then invariably lost marks in (b), usually for writing $x - y > 5$ instead of $x - y \leq 5$ and/ or not realizing that $x \geq 0$ was one of the required inequalities.

Question 25

The majority of candidates attempted this question with only some of these gaining full marks. Many candidates collected the mark for (a) although with not such a lucid statement as expressing the fact that the particle was *stationary*, as had been hoped.

Most of the candidates who attempted (b) realised that the distance was the area under the speed-time graph and usually gained most of the marks, some though, omitted the factor of $\frac{1}{2}$ in their triangular area formulae thus losing all of the marks.

Question 26

Most candidates gained the mark for (a) and (b). The common errors seen in part (c) were $\frac{0+1+2+3+4+5+6}{7}$, gaining no marks, or $\frac{21}{20}$, gaining only the second method mark for attempting a mean value. Many fully correct answers were seen.

Question 27

Able students had no problems with this question. Other students had problems in deciding which of $\left(\frac{6}{10}\right)^2$ or $\left(\frac{10}{6}\right)^3$ to use and in which part. The less able candidates thought that $\left(\frac{6}{10}\right)$ was the ratio to use. The performance of candidates on this question would indicate that it is a topic found challenging by candidates of various abilities.

Question 28

Most students collected the 3 marks for (a) although some thought that the derivative of x^3 was $2x^2$. Of those who answered (a) correctly or partially correctly, most then went to collect the 2 method marks in (b) with only some losing accuracy marks because of algebraic errors incurred in factoring their trinomial quadratic or because their answer to (a) was wrong.

Question 29

Part (a) was usually correctly answered, however many students then failed to express their answer to (b) in terms of π as required. Most of those who had answered (b) correctly, usually went on to collect both marks for part (c) as well.

Question 30

It was pleasing to see that most students now have an understanding of at least the basic trigonometrical ratios and how to apply them with the result that most of the candidates collected some marks in (a) and (b), although some lost accuracy marks for not expressing their answers to the required degree of accuracy.

Although there were many correct answers to part (c), it was clear that the remainder of the candidature either used alternative methods such as geometry to find $\angle AED$ (by assuming that, for example, $\angle CDB = \angle DEA$ (corresponding angles), or that ΔADE was isosceles) or were not able to manipulate their sine rule statement correctly to calculate the answer.

Grade Boundaries

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