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Examiners' Report/
Principal Examiner Feedback

Summer 2015

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

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Grade Boundaries

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There was no general indication that the examination paper was too long, with most candidates making reasonable attempts at most of the questions. Overall, the standard of presentation and clarity of work was high, however, legibility was an issue with a small minority of candidates. 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 or their construction lines. Centers should emphasize to candidates who do need to use extra sheets of paper to answer questions, to clearly indicate this in the answer area of the relevant question in the examination booklet.

Many candidates showed that they have a good grasp of the basic techniques of arithmetic, algebra, geometry and trigonometry and were able to apply them competently. Centers should emphasize to candidates that they should give their answers to the required degree of accuracy as students needlessly lose marks if they do not do so. The question paper did highlight the following problem areas which should receive special attention

- Manipulation of algebraic fractions (Q04)
- Range of a function having a discrete domain (Q06)
- Reflection coordinates in a line (Q09 and Q27d)
- Finding the duration of a period of time (1q1)
- Histograms (Q21)
- Finding the speed of a falling particle (Q22c)
- Finding the perimeter of a sector (Q23b)
- Centers of rotation (Q27a)

Question 1

In was pleasing to see that most candidates answered this question correctly.
Unfortunately, there was a small number of candidates who incorrectly thought that the method was $\frac{22.5}{100}\times 60$ which scored no marks.

Question 2

This popular question was answered correctly by most candidates although a very few made a sign error by thinking that $2x = 4-5 = +1$, losing both marks.

Question 3

This question was mainly answered correctly with common errors being incorrect conversions from kg to g and/or g to kg.

Question 4

A popular question, however, it was noticeable that a minority of candidates have problems with manipulating algebraic fractions. A number of candidates lost the accuracy mark through thinking that $\frac{12}{6a} = 2a$ or failing to simplify $\frac{12}{6a}$.

Question 5

Many correct attempts were seen however a minority left their answer as $y = \frac{x-4}{3}$ or thought that $-\frac{4}{3}$ was the gradient.

Question 6

Many candidates forgot to enter one of the numbers of the range, usually 4, or thought that a *range* was required, for example, $-2 \le f \le 4$, ie not realizing that the range was *discrete*, losing one mark. Fortunately, many correct answers were seen.

Question 7

This question was a popular one with many candidates collecting both marks. A number of candidates thought that it was permissible to divide the quadratic by 2 and so gave $\left(x-\frac{3}{2}\right)(x+5)$ as their factorization, scoring M1 A0. Others gave the roots of the quadratic as their answer rather than the factorization as required (A0).

Question 8

The majority of candidates collected both of the marks for this question.

Question 9

About half of the candidates were confused by the reflection of *P*'s coordinates in the line $y = \square x$ and many permutations of the correct answer ($\square 3$, 5) were seen, scoring, unfortunately, 0 or hopefully 1 at best.

Question 10

The majority of candidates collected both of marks for this question.

Question 11

It was clear that there was a sizeable number of candidates who had problems with finding the planned duration of the film (B0) which resulted in a score of 1 mark out of the 3 available as these candidates usually knew how to calculate $\frac{2}{3}$ of *their* planned film duration (M1 but then A0). The majority fortunately did not have this misunderstanding and collected full marks.

Question 12

It was pleasing to see many fully correct answers to this popular question.

Question 13
Some candidates were confused in part (a) by exactly what "at least one" actually meant and gave their answer incorrectly as $\frac{1}{4}$, although a large number of these candidates proceeded to correctly answer part (b). A common incorrect method in (b) was $\frac{2}{5}\times\frac{3}{4}$ gaining no marks.

Question 14
Two main methods were used to solve this problem – the cosine rule and breaking the isosceles triangle *ABC* into two right angled triangles – and these were usually applied correctly. Some unfortunate candidates misunderstood the demand of the question and calculated the area of *ABC*, gaining no marks.

Question 15
A minority of candidates answered both parts of this question successfully. In (a), a number of candidates found the answer but then carried on and attempted erroneously to oversimplify their answer (M1 A0). A popular but incorrect answer for (b) was 9 (B0).

Question 16
Many fully correct attempts were seen. Other candidates had problems with converting the time into seconds and/or with converting km to m and so were able to collect only 1 or 2 out of the 4 marks available – usually gaining the method mark.

Question 17
In the main, part (a) was answered correctly with only a few mixing up the mode and the median.
The common error seen in (b) was to equate
$\frac{1+2\times2+3+4+3\times5+6+x}{10}$ to $3\times(\text{"5"}-\text{"4.5"})$ and not $3\times\text{"5"}-\text{"4.5"}$ as required (M0).
Fortunately, the majority of candidates answered the question correctly.

Question 18
The majority of candidates collected the two method marks for rearranging both sides of the inequalities but then a significant number of these were either confused by the fact that *x* was an *integer* and so gave a *range* as their answer, usually losing both answer marks.

Question 19
It as pleasing to observe many fully correct answers to this geometry question.

Question 20
Most candidates collected the two marks for finding *DC* = 13 cm but then a number of these lost their way by thinking that the required area was 13×13 (M0 A0). Many, though, correctly found the area of the rhombus.

Question 21
Those candidates who earned marks for this question fell into two – those who collected full marks and those, who in part (a), thought the number of students were 10, 6 and 4 (scoring B0, B1, B0) and then in (b) collected the method mark for their correct numerator or denominator. It appears then that it would be advisable for Centers to devote more time on teaching their student about deducing information from histograms.

Question 22
A sizeable minority of candidates collected full marks for this question. However, a large number of candidates thought that calculus was not involved in the solution of (c) and so wrote $\frac{125-5\times 2^2}{2}\left(=52.5\right)$ or just $125-5\times 2^2$ (=105) as their answer (M0 A0).

Question 23
A number of candidates in part (a) forgot that they were dealing with a sector and thought that they were dealing with a complete circle, losing all three marks. There were many correct attempts at part (b) but, unfortunately, a minority thought that the perimeter was given by only the arc length gaining M1 but then M0 (adding the two radii) A0.

Question 24
Poor algebra let down a number of candidates in part (a) losing them at least two marks. Many candidates were successful in part (a) though. Most candidates, in part (b), collected the method mark for equating their answer to (a) to 291, and if their (a) was correct, usually went on to collect the accuracy mark.

Question 25

The majority of candidates collected full marks for this question. Omitting a factor of $\frac{1}{3}$ was a common error in (a) which resulted in both marks being lost. In part (b), most candidates successfully removed their denominator (M1) and then successfully attempted to solve their trinomial quadratic (M1) with (b)'s accuracy marks depending on the correctness of the candidate's answer to (a).

Question 26
This was a popular question with the majority of candidates collecting all 6 marks. The candidates who unfortunately failed to find k = -22 in (a), usually collected only 1 mark in (b), this being the second method mark (solving their trinomial quadratic).

Question 27
A minority of candidates answered (a) correctly and of these, many carried on to collect full marks for this question although some lost the last mark in (d) for not correctly stating that their reflection was in the line x = -1, many thought the reflection was in the $y = -x$ or in y = -1 (A0). Most collected the two marks in (b) for the matrix multiplication followed by two marks in (c) for drawing their triangle, some collected these follow through marks even though their matrix multiplication in (b) was wrong.

Question 28
Most of the candidates attempting this question did so successfully. Others usually got one of the equations required in parts (a) and (b) wrong but then usually managed to collect the two method marks for attempting to solve their simultaneous equations in (c). Others lost these two marks because of their poor algebra.

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