Examiner's Report
Principal Examiner Feedback

Summer 2018

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

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General Comments

There was no general indication that the examination paper was too long, with most candidates making attempts at most of the questions. Overall, the standard of presentation and clarity of work was high, however, the legibility of the answers was an issue with a small minority of candidates. It should be emphasized that candidates should be encouraged to include their working in their answer books 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. Centres 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.

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. However, there were a number of candidates whose lost valuable marks because of their poor algebraic handling. Centres should emphasize to candidates that they should give their answers to the required degree of accuracy as marks are needlessly lost by not doing so. The question paper did however highlight the following problem areas, followed by their corresponding question numbers, which should receive special attention:

- Carefully reading and understanding a question (27(a)(ii) & 28(a))
- Poor algebraic manipulation (12, 18, 24(a)(ii), 26 & 28)
- Time notation and calculation of time differences (1)
- Manipulation of indices of numbers (10)
- Secant-tangent theorem (14)
- Interpretation of distance-time graphs (23(a, c & d))
- Histograms and estimates of the mean using midpoints of intervals (27)
- Use of midpoints in estimates of a mean (27)

Question 1

This was one of the discriminators of the paper in that there were a number of candidates who were not sure how to find the time difference between the London and Delhi times. Others tried to subtract the two given times but were confused by the notation and erroneously thought that a time given as 9.42 meant $9\frac{42}{100}$ hours, losing both marks. Of those that realized that a time such as 9.42 meant 9 hours 42 minutes usually collected both marks with ease.

Question 2

Most candidates were able to find the prime factors of at least one of the two given numbers or to find enough of them to proceed to find the highest common factor (M1A1). As in previous examinations, there were a number who were not sure what a highest common factor was and so lost the accuracy mark.

Question 3

On the whole, this differentiation question provided no obstacle to most candidates. The others found difficulties with the differentiation of $-x^{-5}$.

Question 4

The majority of candidates collected full marks for this question on sequences.

Question 5

It was clear from the candidates' answers that many knew what a natural number was and were able to find one. However, there were a number who were perhaps confused by the form of some of the given numbers with the result that these candidates lost one or both marks by having numbers such as $2\frac{1}{4}$ and even $\left(\sqrt{2}+3\right)$ in their list.

Question 6

It was pleasing to see many candidates collecting both marks for this geometry question and also to see that candidates were aware of the different routes to the answer.

Question 7

In the main, this question was correctly answered. Many of the others, usually collected the first mark for their attempt at the determinant but then either made an algebraic slip in applying the inverse matrix formula or did not know it.

Question 8

As was expected there were a few candidates who were not sure what an angle of elevation was and lost both marks (usually because of using the incorrect trigonometrical ratio). Most of the others collected full marks.

Question 9

Most candidates managed to collect at least one mark for this question by finding two of the three factors of the given expression. The more gifted candidates collected all the marks.

Question 10

The question was one of the discriminators of the paper. Many candidates did not have a strategy for the question's solution. Of those that did, many managed to rewrite the given expression in the form $\left(1+2^5\right)\times 2^n$, gaining the method mark but then usually failing to either find the correct value of n or the correct values of m and n. Some candidates tried to write the given expression in powers of 10 and lost both marks.

Question 11

There were a number of candidates who had difficulties with finding the length of the other side of the rectangle (B0). Of these, those who identified their length as that of the other side, were able to collect the method mark by using it in the volume formula. Many candidates had no such problems and collected full marks for the question.

Question 12

Most candidates attempted to remove the denominator $(1-2x)$, however, many made algebraic slips which made the accuracy mark unattainable. The majority of candidates scored full marks.

Question 13

Weaker candidates struggled with arriving at the ratio of b to c (M0 M0) whilst many of those that could, failed to simplify their form of $b : c$ (usually left as 48 : 33) losing the accuracy mark. The majority of candidates provided a fully correct answer to the question.

Question 14

Weaker candidates invariably mixed up BD with BC in their statement of the secant-tangent theorem resulting in the loss of all marks. Those who had a correct statement of the theorem correctly found BC (M1A1) and usually went on to calculate the radius (A1).

Question 15

The abler candidates found no difficulties with this question and it was pleasing to note that many of the less abler candidates had most of their inequalities the correct way around, however, a number of these made life difficult for themselves by trying to rearrange the inequalities.

Question 16

The majority of candidates collected full marks for this question. Most of the rest did not realise that $(A \cup B)' = A' \cap B' = "\{3, 6, 7, 10, 14\}$ (by the De Morgan law) and made mistakes in finding the elements of the intersected sets, usually resulting in the loss of both marks for part (b).

Question 17

A few candidates did not really understand how to find a median and lost the mark in (a). However, many of these were able to use their value for x in part (b) and so collect (and many did) the two marks that were available because the final accurate mark was follow through on their value of x.

Question 18

Many candidates were successful with this question, correctly choosing one of the three main methods: expansion, algebraic division or synthetic division. Some candidates were severely let down by their poor algebra when expanding the right hand side of the given equation and lost all three marks.

Question 19

This standard question was answered well by the majority of the candidates. Some of these, though, collected the two marks for the constant but then failed to take the cube root as required in the latter half of the question and so collected only 2 of the 4 marks available. Only a few candidates mistakenly thought that *s* varied *indirectly* as t^3, perhaps because they had not read the question carefully enough.

Question 20

Most candidates collected the two method marks for finding the two inequalities but then lost both or one of the following accuracy marks for missing values of x or for given a continuum of values of x rather than the integer ones as requested, a common mistake seen in previous examinations.

Question 21

Many candidates were successful in part (a) but then found part (b) problematic possibly because of the form of the given ratio for AP to PB. In part (c), a number of the weaker candidates thought that the modulus of $\overrightarrow{AP}$ was obtained directly from their $\overrightarrow{OP}$ and did not realize that $\overrightarrow{AP} = \frac{1}{3}$" $\overrightarrow{AB}$ " thus losing the two marks.

Question 22

Overall, this question was answered by most candidates, however, the use of a short radius for the arcs in (c) made it harder to these candidates to draw an accurate course.

Question 23

Parts (a), (c) and (d) were discriminators of the paper with few candidates collecting all three marks. It would be of benefit to candidates if Centres spent some time on the interpretation of distance-time graphs. In part (b), many candidates picked up the first B mark for starting their straight line from (0, 5) however a sizeable number of these drew an incorrect straight line, thus losing the second B mark.

Question 24

Most candidates correctly stated the dimensions of the pond in (a)(i) and went on to successfully complete (a)(ii) but the algebra of some was imperfect, losing the last two marks. In part (b), many incorrectly thought that it was sufficient to find the conditions from $A>0$. Very few, though, realized that the possible values of x were given by the dimensions of the pond thus losing both marks of (b).

Question 25

The majority of candidates scored well on this question demonstrating that the basics of trigonometry are understood by these members of their cohort. Unfortunately, some candidates tried to simplify the question by incorrectly thinking that $\angle BAD$ was 90^{o}, potentially losing all of the marks for the question.

Question 26

Part (a) was correctly done by nearly all candidates. Most candidates collected the first mark of (b) but a number made algebraic errors and lost the accuracy mark. Most candidates could write down the correct expression for fg (M1) in part (c)(i) but then made algebraic errors (M0A0). Some of these candidates managed to collect the B1 follow through in (c)(ii) if the denominator of their answer to (c)(i) was of the required form $(ax + b)$.

Question 27

Most candidates had a reasonable attempt at part (a) and many of these labelled their Frequency density axis from 0 to 18 in increments of 2 which led most of these candidates to the correct answers for (a)(i) and (ii). However, a minority did not read that (a)(ii) was concerned with distances between “4 km to 6 km” in (a) (ii) and obtained the answer for 4 to 8 km, namely, 56 shops. Many candidates were confused by the concept of midpoints in (b) sometimes losing the first method. Others only got one midpoint wrong or used their (possibly incorrect) values from (a) and collected 2 marks (M1 M1 A0).

Question 28

Most candidates realized in part (a) that the forward was a Pythagorean Theorem statement for triangle AOB (M1). Some candidates were careless with their algebra thinking that $(5x)^2$ was $5x^2$, potentially losing the remaining marks for part (a) – although fortunately some candidates recovered. A correct Pythagorean statement usually lead so $x = \frac{13}{12}$ but a number then forgot to multiply by 5 to obtain the length of ladder (A0). In part (b), most of those who had a good attempt at (a), collected at least the M1 by remembering to multiply their x by 5 for the ladder length.