Pearson

Examiner's Report
Principal Examiner Feedback

Summer 2018

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

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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, 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 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. The working is *essential* 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. 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:

- Ratios and percentages (3)
- Carefully reading and understanding a question (4, 14, 18, 24 & 26b)
- Poor algebraic manipulation (10, 11, 12, 17, 25 & 27)
- Secant-tangent theorem (18)
- Mensuration of 2D shapes unknown side lengths (25)
- Algebraic indices (26)
- Mensuration of 3D object (28)
- Probabilities of related events (29)

Question 1

In was pleasing to see that most candidates answered this question correctly. Unfortunately, there was a small number of candidates who had no idea and thus made no attempt at answering the question whilst others made an arithmetic slip in manipulating the components of the two vectors and lost one mark (A0).

Question 2

The majority of candidates successfully answered this question. Others erroneously thought that the method was $\frac{27}{360} \times 150$ or that a percentage was required (M0A0).

Question 3

Many candidates answered this question correctly. Common errors which resulted in the loss of both marks were $\frac{3}{4} \times \frac{20}{100}$ or $\frac{3}{4} \times 20\%$ followed by an incorrect method for calculating 20% or no attempt at calculating 20% (usually ending up with an answer of $\frac{60}{7}$.

Question 4

Many successful attempts were seen but many of the others thought that $24 \times \frac{3}{4}$ was the number of adults or $24 \times \frac{1}{4}$ was the number of children (M0 in both cases). Perhaps Centres should stress the importance of *carefully* reading a question.

Question 5

The majority of candidates collected both marks for this question. The common mistake of a number of candidates was to think that the consequence of the similarity of the triangles led to $\frac{PY}{XY} = \frac{YR}{QR}$ (M0 A0).

Question 6

A popular question which was marred by a number of candidates unable to find the common denominator of the two algebraic fractions or failing to give their answer in its lowest terms.

Question 7

In general, this question posed no problems to the majority of candidates although some thought that all they had to do was to find the radius of the circle (M1 M0A0) whilst others rounded their radius and lost the final mark for an incorrect answer.

Question 8

Many candidates knew the formula for the area of a trapezium and used it to collect the three marks. Others were not so sure and lost the three marks whilst others applied the formula correctly but lost the latter two marks because of inaccurate algebra.

Question 9

Part (a) was usually correctly answered. In part (b), a significant number just gave an answer of {4, 6} losing both marks whilst others missed one or more of the elements from $A' \cap B$.

Question 10

The common error with this question was a lack of care when handling signs usually resulting in the loss of at least one mark of the question (as one slip was allowed in the two method marks).

Question 11

Part (a) was usually correct. Many candidates in part (b) realized that the way forward was to write $25-2n>n$ (M1) which normally resulted in the correct answer of 8 (A1). Poor algebra led to the loss of the accuracy mark. There were a significant number of candidates who were not sure what to do or wrote $25-2n>23$, using their answer from part (a), and so lost both latter marks (M0 A0).

Question 12

As in previous questions of this type, a number of candidates knew how to proceed to the solution but were let down by their poor handling of signs or poor algebra (for example, when rearranging the original equations or when removing the brackets or when transcribing their rearranged equation) resulting in the loss of usually both latter marks (M0A0).

Question 13

Many candidates collected the first two marks and the more gifted ones collected the final one. However, it would be prudent of Centres to instruct their pupils in the clear shading of required sectors rather than using several forms of shading without any explanation of their meaning.

Question 14

There were numerous candidates who were confused by this question and so do not try to express the given ratios in one of x, y or z. Many others did but stopped at $6z : 3z : z = a : b : c$ or some equivalent (M1M0A0). It was the more gifted candidates who were able to use the ratio just given and proceed to the answer.

Question 15

Many candidates collected all three marks for this question. Others failed to give a two significant figure answer (M1M1A0) or lost all three marks by failing to give the first step of the method $\left(\frac{5000}{6.4 \times 10^{-6}}\right)$ or in some equivalent form (M0 M0A0).

Question 16

The majority of candidates collected all three marks. There were some candidates who did not realise the need for differentiation and substituted $x = 2$ into the equation for **C** (M0 M0 A0) whilst others used another point (in addition to the given (2, 12)) of the curve **C** to calculate a gradient (M0 M0 A0).

Question 17

Many careless mistakes were seen in the removal of the brackets in the given expression and also in the algebraic manipulation of signs resulting in the loss of all the marks of the question if two errors were seen or two marks if just one error was seen. It is pleasing to note though that a significant number of candidates collected all three marks.

Question 18

There were two sources of error with this question. Many candidates lost all the marks because they were not sure how to apply the intersecting chords theorem correctly (losing all the marks) or they stopped at having found AX and forgetting that the length of OX was required – again perhaps because they had not read the question carefully enough. The others who got over these hurdles usually collected all three marks.

Question 19

The main sources of error in this question was the careless manipulation of the elements of the matrices when performing arithmetic operations. Fortunately the method marks were independent of each other so many such candidates gained at one method mark. The majority of candidates collected all three marks.

Question 20

Many candidates knew the formula for the area of a rhombus and collected both marks of part (a). In part (b), many candidates failed to realise that they had to find the length of a side of the rhombus and so 24 + 24 + 10 +10 was often seen for the perimeter (M0 A0). Nearly all of the candidates who realized that they had find the length of a side (by, for example, calculating $\sqrt{5^2 + 12^2}$), gained by of the marks for this part.

Question 21

Many correct answers were seen to both parts of this question. A common error in part (a) was to use think that 175 was 84% of the number of runners in the 2017 marathon (M0A0). In part (b), the following incorrect answers obtained no marks: \$600 (80% of \$750), \$630 (84% of \$750) and \$900 (120% of \$750).

Question 22

Many fully correct attempts were seen at this question. Many candidates displayed their understanding of trigonometry and thus gained full marks. Some candidates marred their attempt by using premature approximations in their calculations, losing the accuracy mark. Others either correctly obtained BC or CD (M1) and proceeded no further or simplified the problem by assuming that 10 cm was the length of DX, where X is the intersection of the kite's diagonals AC and BD, losing all marks.

Question 23

This question received many correct attempts once the initial equation is formed. A common fatal initial error was to find a constant denominator rather than one which was a linear function of a (ie $20 + a$), losing all the marks. A number who correctly got over this hurdle, unfortunately spoilt their answer by poor algebra (M1 M1 M0 A0 or M1 M0 M0 A0).

Question 24

It was pleasing to see many correct constructions gaining full marks. Other attempts lost marks by not showing all construction lines as requested by the question, or through inaccurate constructions.

Question 25

Most candidates simply did not grasp the nature of the question but there were still many candidates saw that the way forward was first calculate the length of the square's side (13 cm), then to use $(34-2x)x=144$ for the area of the small rectangle and so find x. Another approach was to note that $\left(\frac{144}{x}+2x\right)^2=1156$ by considering the area of the square. Candidates using either approach usually produced the correct resulting quadratic and thus the correct values of x. The other candidates were let down by their poor algebra collecting usually 2 or 3 of the possible 5 marks.

Question 26

Both parts of this questions were discriminators of the paper, separating the gifted from the not so gifted candidates. Many candidates had problems with correctly replacing the square root sign with the indice $\frac{1}{2}$ and then combining it with the other indices, usually scoring nothing.

In part (b), many candidates had no ideas about what to do with 4^{3n} and 8^n and so were not able to arrive at $6n = 1 + 3n$, scoring no marks. Sadly, other candidates found that $n = \frac{1}{3}$ (M1M1) but failed to use it to find that $8^n = 2$, as required, again failing to carefully read the question.

Question 27

Part (a) was usually attempted correctly, although candidates marred their algebra and did not find the correct value for k (M1 A0). If $k = -4$ was found in part (a), part (b) was usually correctly answered. Many of those who failed to find the correct value of k, normally collected the second method (independent) mark for solving a trinomial quadratic. It was pleasant to mark many fully correct answer to this question.

Question 28

In part (a), many correct attempts at finding the surface area of a triangular face were seen (M1) but sadly, a significant number of candidates then failed to add the area of the square base to the areas of the *four* triangular faces (M0A0). Many candidates fell at the first hurdle of part (b) which was to find the height of the pyramid and so usually lost three marks as they usually found the length of the base diagonal (M1) or the height of a triangular faces

(M1) but in both cases failed to carry on and find the height of the *pyramid* (M0 M0 A0). There were, though, many fully correct attempts at this question.

Question 29

This was *the* discriminator of the paper. Many candidates had no idea of how to proceed as they were unable to break the question down into its constituent parts and then to rebuild them with the result that a small number obtained a few marks for stating a correct probability for moving beads from **A** to box **B** and/or for moving beads from box **B** back to box **A** but then had no idea of what to do next. It would be beneficial to candidates if they were drilled in breaking down similar questions into constituent parts in order to find a method of solving such a question.