Pearson Edexcel

Examiners' Report
Principal Examiner Feedback

Summer 2025

Pearson Edexcel International GCSE
In Mathematics B (4MB1) Paper 01R

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Introduction

In general, this paper was well answered by the majority of candidates. Some parts of the paper did prove to be quite challenging to some candidates, such as the average speed on question 13, the sum and modulus of resultant vectors on question 15 and the more challenging questions 23 and 25.

In particular, to enhance performance, centres should focus their candidates' attention on the following areas:

- Showing clear working, particularly when it is requested in the question eg question 15, question 17, question 21, question 23, question 24 and question 25
- Annotate diagrams as these are often marked eg question 7 and 18
- Focus their candidates' attention on the following topics
  - Calculations to find the average speed when given information about the two or three parts of a journey
  - Shapes with similar length, area and volume
  - Angles and Circle theorems (including reasoning)
  - Questions involving trigonometry and Pythagoras within 3D shapes

Question 1

An accessible start to the paper with may correct answers seen. Occasionally, just one of the two marks was earned for a partial factorisation or for correctly identifying the HCF with an answer to one of the required forms.

Question 2

This question proved to be accessible for the majority of candidates. However, there were some answers of 146 and 214 were seen. In the case of the former, this earned M1 but for the latter, this scored zero. Another incorrect answer seen was 304 and this tended to earn M1 by the calculation 360 – (146 – 90).

Question 3

The cohort for this paper tend to be good at algebra and this was no exception, with many correct answers seen. The most prolific error seemed to be finding the right expression for x,
($x = (t - 24)/6$) and subsequently dividing 24 and 6 by 6 to arrive at $t - 4$). Such candidates, (and there were a few), scored one mark only. A sign error tended to lead wayward candidates to a Special Case B1 mark

Question 4

Again, many correct answers were seen, however, this question tended to earn either zero or two marks with very few scoring one mark. There were a significant number of candidates who did not recognize the reverse percentage element and therefore found 8% of the given value and either added (1092.96) or subtracted (931.04) for no marks.

Question 5

Popular, but erroneous, answers were of the form $2^5x^2y^{14}$ which earned 1 mark and $32x^3y^7$ which came from $64x^4y^8/2xy$ and earned nothing.

Question 6

The method of completing the square was a well and tried method used by many candidates and $(x + 3)^2 - \dots$ was seen on many scripts. Occasionally the +3 was replaced by –3 and consequently all the marks were lost. Where the candidate had a correct expression with –24, an answer for $b = -24$ was accepted.

Question 7

Whilst many candidates were able to arrive at the required value for the angle, not all could give a correct reason. Centres should be reminded that they need to instill into their candidates the minimum acceptable reasons for angles in a triangle or between parallel lines. Parallel lines and simply saying straight lines is not sufficient. The list of reasons should also extend to circle theorems which are also required in Question 18.

Question 8

Part (a) was well answered with the most common incorrect answers being 15.3 as candidates seemed to have confused the term mode with mean but also 28 as if there was some confusion between mode and most being the largest value rather than the most common value. In part (b) some candidates lost both marks because they left a value off their ordered list. As with part (a) there were some who calculated with mean instead of finding the median.

Question 9

Part (a) was accessible to most candidates with the most common error being with the isolating the term in y where candidates added rather than subtracted the $3y$. In part (b) common errors included having the closed circle at –1 instead of 1, having an open circle rather than a closed circle and not extending the line far enough.

Question 10

The vast majority of candidates were able to show a correct conversion from \$ to £ or vice versa. Where some candidates went wrong was in writing down an equation for d using mixed units. Those candidates who lost only one mark tended to be for an answer of (£) 50 rather than the required value of (\$) 64.

Question 11

Ignoring the correct unit conversion led many candidates to two of the three marks here. Some candidates used sine instead of tan and although this led to a correct answer due to sin6 being approximately equal to tan6 were awarded zero marks due to the incorrect method.

Question 12

Although many candidates understood the connection between the ratio of lengths, areas and volumes of similar figures, getting the equation round the correct way proved challenging and 545.13 proved to be a popular, but erroneous, answer. This value invariably came from $(900/25)^2 = (x/50)^3$ rather than $(900/25)^3 = (x/50)^2$. Despite such errors, a correct answer of 10800 was often seen.

Question 13

This question proved to be quite challenging for some candidates. Many did not seem to appreciate the average speed = (*total* distance travelled/*total* time taken) and many first calculations involved simply adding together the given two speeds which did not auger well for any correct development of a solution. For these responses a score of zero marks was awarded.

Question 14

Whilst much correct working leading to the required answer was seen, a small minority of candidates calculated a numerator by the summation of *frequency* × *class width* rather than *frequency* × *mid-class value*. Some candidates divided by 5 rather than 30, resulting in a maximum score of two marks.

Question 15

A particularly challenging question with only the strongest of progressing past the length of the vector *OB* or, under the alternative scheme the length of the vector *AC* in terms of x and y. Stronger responses showed the introduction of a parameter when showing the vector *AB* = k x vector *OB*, or, using the alternative method, linking x and y into a gradient equation. Reaching the required answer proved to be challenging for many and, as a consequence, this question was quite a discriminator.

Question 16

Using an arc formula followed by a sector formula was comfortably handled by a large majority of candidates. Only a few responses had the formulae the wrong way round and even a smaller number used the arc length for the two radii, *OA* and *OC*. Some responses showed a fundamental error as indicated in the first party of the solution, generated a value of r and were able to use this value in a correct sector formula to achieve one mark.

Question 17

Many candidates seemed to be well drilled in converting fractional surd expressions into a required format and much good work was seen in reaching $13 + 5\sqrt{(7)}$. Of course, this could have been achieved using the calculator but the vast majority of candidates showed good order to reach this stage of the solution. Only the stronger responses obtained full marks from taking account, the required form for the answer.

Question 18

Some good work shown in both parts of this question with many correct answers seen. Part (a) perhaps generated the most errors with angle $ABC = 2 \times 52 = 104$ degrees being quite common. Another clear misunderstanding of circle properties was evident where some candidates gave their answer as 52 (angles in the same segment). Part (b) was better answered, but the reasons given for both parts were not always acceptable. As with Qu7, centres should be reminded that their candidates should know the acceptable reasons for geometrical questions.

Question 19

Part (a) was better answered than the second part with many able to give an equivalent form for the answer but not necessarily in Standard Form (27×10^{204} was a popular, but erroneous answer earning the method mark only). In part (b), a significant number of candidates seemed unsure with two negative indices in the question. Of those that did recognize that 10^{-4n} was required, a significant number left their answer in the form 0.5×10^{-4n}, hence losing the final mark.

Question 20

Parts (a) and (b) were accessible to the majority. Part (c) however proved a little more challenging in that a significant number of candidates simply gave the range of values for which the quadratic, $x^2 + 8x - 20 > 0$. Whilst this gave the required answer of $x > 2$, the mark was not gained where the candidate has also included $x < -10$. Such candidates showed good algebra but failed to put their answer in the context of the question.

Question 21

Whilst on the strongest responses showed an understanding of the requirements for this question and achieved a score of 4 marks or more, other responses scored no more than 2 marks here. The two marks tended to be at least one correct bound followed by an expression for the volume in terms of the mass and density. Some candidates lost marks as they did not include the '1/3' in the formula for the volume of the pyramid and hence the third and subsequent marks were lost. Another reason for candidates not scoring more than two marks was due to having at least one of m, x, y and d outside of an acceptable range.

Question 22

There were mixed responses for part (a) with some candidates showing their clear understanding of calculations involving frequency density. In part (b) an incorrect equation of the form $(x + 24)/(x + 160) = 3/8$ was often seen, which scored a maximum of two marks.

Question 23

A challenging question that many candidates appeared unsure of how to being. Strong responses scored two marks which was invariably achieved by a correct evaluation of the matrix **B**. (Some candidates benefitted with the tolerance of errors here). Some of the stronger responses then went on to find the required matrix for $\mathbf{B}^{-1}$. Only the strongest responses formed a correct equation as many equated the determinant of B equal to -1/6.

Question 24

Candidates seemed to be well drilled in attempting the solutions of this type of simultaneous equations. Most were able to start with the process of finding a quadratic in one variable to earn the first two marks. If their quadratic was not quite correct, many still showed the due processes for solving the quadratic and substituting their found values back to attempt to find at least one value for the other variable. In this situation it was important for candidates to show the substitution of their a, b and c into the formula rather than just use the solve function on their calculator.

Question 25

This question was challenging and only the strongest of responses scored. Many candidates seemed unsure of how to begin with stating and using the volume of a cone seemed to be a popular, but an unhelpful start. Some candidates tried to use the length of the side of the cone with the given length of $\sqrt{(134)}$ but using the data incorrectly. Working out appropriate lengths (in terms of $\sqrt{2}$ or the decimal equivalents) was the key and the few that were able to progress, were able to find the correct lengths of AC, XC and either XA or XY. A mark of 2 or 3 proved to be popular in this respect for a significant number of candidates. Progressing to a full mark response proved to be challenging as many followed correct working for lengths with an incorrect equation in h.

Question 26

Stronger responses were able to show understanding with this functions question. Parts (a) and (c) were well done with part (c) showing good algebraic processes. Part (b) proved to be the most challenging. The critical bound was identified but then spoilt with an incorrect inequality or using $x > 3$. A significant number of candidates tried to solve the inequality $3 - 5/x > 0$ leading those candidates to the erroneous solution of $x > -5/3$. In part (d), many candidates showed the correct process for evaluating a composite function (only on a few scripts was it noticeable that gh(x) was interpreted incorrectly as g(x).h(x)). Some slips in algebra manipulation meant that some candidates lost out on the final mark.

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