Examiners' Report
Principal Examiner Feedback

Summer 2025

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

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk. Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

Pearson: helping people progress, everywhere

Pearson aspires to be the world's leading learning company. Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

Summer 2025
Publications Code 4MB1_01_2506_ER
All the material in this publication is copyright
© Pearson Education Ltd 2025

Question 1

A majority of candidates scored 2 marks on this question, although the number of rounding errors were surprising. There were very few incorrect calculations. Where candidates lost marks, it was often by not realising the zero is significant, rounding to five decimal places or perhaps not reading the question and giving the answer to the standard 3 significant figures. Students frequently wrote the answer down only, so any calculator error generally resulted in no marks.

Question 2

A very well answered question with few errors seen, other than transcription errors. The very occasional error seen was perhaps from mistyping into a calculator.

Question 3

A significant minority of candidates scored full marks on this question. An answer of 12 or 5040 was very common, suggesting maybe an unawareness of the definitions of interior and exterior angles.

Question 4

Although many reached the correct final answer, candidates relatively frequently did not score full marks, as they did not show the minimum steps required. The vast majority could change the mixed numbers into improper fractions, but the most common step missing was conversion to a common denominator. This should be accessible to most and centres could stress the importance of showing all the necessary steps for such questions.

Question 5

Accessible to most candidates, there were a number of errors made by candidates accessing the lowest grades. Common errors included simply subtracting the numbers without squaring, squaring the numbers but adding or attempting to use trigonometry, but not proceeding past the first step.

Question 6

Although a pleasing majority of candidates were able to cope with the algebraic demands of this question, the most common error was seen at the first step, particularly $5d = g - 4e^2$. Although marks were rarely lost, it was very common to see an expression on the answer line without *d* as the subject. This was permitted, if seen in the body of the working. All equivalents were allowed, including a reversal of all signs.

Question 7

The majority correctly identified the region between – 4 and 2. The main error was not having the correct shading (often transposed or same shading at both) or not having any circles at either end. Some drew more than one line, often with arrows. A common error was to stop a line at 1 instead of 2. Occasionally, circles drawn were so small, it was difficult to see whether they were open or closed.

Question 8

(a)
This was generally very well answered, although it was quite common to see p^1 or p =1.

(b)
Most candidates could simplify this correctly, but a significant minority completed further work, suggesting that they did not fully understand the question. Of those who scored 1 mark (other than as a result of further work), it was usually the number which was incorrect, often written as 32 instead of 8.

Question 9

Although a large minority of candidates attained full marks, a mixed range of responses were seen to this question. Many found the correct three-part ratio or two ratios where the train value was equal, but did not know how to progress from there.

From there, a variety of next steps were seen. Some candidates were able to relate the train value of 600 to the correct part of the ratio to continue their workings to a fully correct solution. Occasionally, candidates mistook the 600 to represent both parts of either ratio and shared it equally, gaining no further marks. A common one mark only response was to see 360 or 960 only.

In responses where full marks were not obtained, candidates often multiplied by a fraction with a denominator of 43. It was common to see 600 × 27/43 then × 43/10, showing a lack of clarity of what the value(s) found related to

Question 10

This question presented a challenge to many candidates, even those with an understanding of HCF/LCM.

(a)
This part saw the most successful responses. Some candidates lost the mark by not writing their answer as a product of primes, putting 4 rather than 2^2. Others, after finding a correct answer, simplified' by multiplying 2 by 3. Ignore subsequent working was a difficult principle to apply to this question, as it usually demonstrated a lack of understanding.

(b)
This was less well answered than (a). More candidates struggled to identify the correct factors, probably due to this being more algebraic. Similar errors were seen, for example 16 rather than 2^4. Additional errors included using the wrong power of 2. 2^6 and 2^9 were often seen.

(c)
This part was seldom answered correctly. There were a variety of incorrect answers ranging from 1 or 2 (perhaps a misunderstanding of "even" in the context of the question), to very large numbers. Occasionally candidates wrote 3 or 7, which at least showed some insight into the question.

Question 11

Although the majority scored full marks, the decomposition was not always well shown. It was clear when candidates had used their calculator to progress to $15\sqrt{3}$ and $6\sqrt{3}$ without showing this. Centres could emphasise the need to identify square numbers within a decomposition and show all minimum steps to demonstrate the required understanding. A common incorrect condoned answer was $\sqrt{243}$. Some candidates used their calculator with decimals to reach 243, which was worth no credit beyond the point at which decimals appeared, unless recovered.

Question 12

This was a well attempted question, with a majority of candidates awarded at least one mark for correctly finding a common denominator – the most common way of completing. Those who scored the next mark usually scored all three, but sign errors or incorrectly expanding brackets, especially $4(x – 1)$ to $4x – 1$, often led to incorrect equations and no further marks. When answered correctly, most candidates chose to find a common denominator and combine the fractions before multiplying by 12. Candidates choosing other routes were generally less successful.

Question 13

Those who had learned the Intersecting Chords Theorem answered this well, with few of these not able to find the radius correctly from EC = 18.2. Common mistakes included muddling the ratios, using $20 \times 13 = 5 (5 + x)$ or assuming AC was the diameter and taking EC to be 15.

It was clear a significant minority of candidates were unfamiliar with the theorem.

Question 14

Many candidates failed to attempt to draw a tangent, with a number of these drawing a chord from (0, 0) to (5, 40) or even a horizontal and vertical line through (5, 40). Of those who drew an acceptable tangent, this was frequently sufficiently accurate, with the majority of the candidates able to pick up the second method mark by identifying two points and calculating a gradient. Very occasionally, the numerator and denominator in the gradient were incorrectly reversed. Few failed to read two points correctly from their tangent with answers outside the accepted range. Occasionally, we saw candidates who'd drawn a correct tangent then progressing to calculate $\frac{40}{5}$. A mark was still given for the tangent drawn, even if not then used in the solution.

Question 15

An overwhelming majority of candidates scored at least one mark, either for stating the value of *OTS* or *TRO.* Of these, many successfully found $x = 34$. Even though the mark scheme was generous in the reasons accepted, a significant minority of students failed to gain four marks after gaining three, often for incomplete reasons, missing key words, or comments such as tangent meets the centre/circumference at 90.

For those who did not progress to $x = 34$, the more common errors included attempting to use the Alternate Segment Theorem incorrectly or to use alternate angles, with no parallel lines.

Most candidates chose to mark their angles on the diagram which seemed to help them to success.

Question 16

(a)
A reasonably well answered question, although a common error was to not fully factorise the expression with many scoring one mark for a partial factorisation.

(b)
A majority of candidates could factorise the quadratic correctly, but a small number then lost a mark though continuing to solve for x, demonstrating a lack of understanding of the difference between an expression and an equation and of what they were being asked to do.

Another common error was getting the signs the opposite way round inside the brackets or mixing up the rule about the product and sum of the numbers in the brackets, in terms of the coefficients of the original expression.

Question 17

Most candidates scored at least one mark for finding the volume of the cuboid, although we often saw confusion between formulae for volume and surface area. A large number of candidates had the correct notion about the complete method, but there was even more confusion between the formulae for volume and surface area of a sphere or muddling up the two with $\frac{4}{3}\pi r^2$ often seen or used.

Most coped well with being given the diameter rather than the radius, but a surprisingly large minority of candidates thought there were eight spheres rather than six or just used the formula for one sphere. Many did not round to the required three significant figures but were not penalised for answers which rounded to the correct answer to three significant figures.

Question 18

(a)
Although there were some blank responses to this question, a significant number were able to score some marks, with many able to complete both the table and diagram correctly.

Of those who did not score full marks, gaining marks from having correct frequencies was most frequent. However, marks were often lost from one or both bars draw incorrectly. The first bar was mostly correct, with the second bar seeing more errors, often being too high or insufficiently wide. Occasionally, candidates had an incorrect frequency density scale, but this was typically paired with a scale factor seen in the working.

(b)
This mark was often gained, but it was surprising how many candidates didn't know what was required.

Question 19

A generous mark scheme allowed many candidates to be awarded three out of four marks for separately substituting into two proportion formulae. The final mark was more elusive as candidates often were often unable to correctly combine their equations together. As the question did not ask for simplification, many were able to score the final mark for combining the two equations, despite incorrect working which followed, which was very common.

The answer on the answer line was frequently missing "f = ", although this was almost always seen previously and didn't lose the final mark if so.

Candidates who failed to score three or four marks often struggled with the inverse proportionality equation or failed to include constants of proportionality.

Question 20

This question was one of the least accessible to many candidates, with only those working at the highest grades, gaining full marks for a final correct answer and solution.

The vast majority of candidates scored the first mark for stating at least one of the correct bounds, with 2135 and 0.75 commonly used, but the upper bound of r proved to be more challenging. This was most frequently why most candidates failed to progress to three or four marks.

Those who calculated $\frac{m}{d}$ first seemed to be more successful in completing the correct rearrangement to find h. And we often saw the incorrect formula for the volume of a cylinder used.

Question 21

(a)

Somewhat surprisingly, this was often the least well completed part of this question with many not understanding that simple subtraction was required. Some candidates subtracted the wrong way round, but this gained no credit.

(b)

Generally, well attempted and often correct with few errors in finding the determinant. We did sometimes see confusion over which signs to change and which entries to swap.

(c)

This was also generally done well with the main error coming from getting 5 rather than 55 on the second row.

Question 22

This question saw the most errors and varied answers. Whilst many candidates were able to gain the first mark in substituting one equation into the other, there were varied degrees of success beyond this. This question often involved complex algebraic manipulation, particularly when dealing with expansion of squared brackets and fractional coefficients. Centres could spend more time helping candidates recognise the different routes available when presented with such a question and that some almost always require less complex manipulation than others.

In general, candidates who opted for multiplying the quadratic by three first, thus removing the fractions, were most successful. The second group of most successful candidates chose to rearrange the second equation for y and substitute into the first.

The third mark was frequently scored for those with a three-term quadratic, with only a few relying completely on their calculator and the last method mark was again usually awarded for those who did not leave their answers in surd form.

A fully correct solution was seen a pleasing number of times, but as marks were dependent on the first, as this question could be completed on a calculator with little real mathematical knowledge, so working had to be shown, a not insignificant number of candidates scored 0 marks.

Some candidates ran out of space and centres could remind candidates to ask for extra paper, if this happens.

Question 23

(a)
The overwhelming majority of candidates scored at least one mark for multiplying the frequency by a value within the interval, although a few used the same value such as 300 or 600 for every interval.

A significant number of candidates knew the correct method and pleasingly, it was rare to see division by 5 rather than 100. A few arithmetic/calculator errors occasionally led to inaccurate answers.

(b)
The most common response we saw to this was awarded the first method mark only. Candidates frequently struggled to gain further marks beyond this, often stopping after finding a value of 324. A common mistake was in subtracting the means from each other or simply dividing 2976 by 91.

Question 24

Although we often saw a blank response, a significant number of candidates could cope well with the trigonometry. Candidates struggled most with the bearings part of the question with four marks a very common score and for those who understood less, two marks, where candidates were given credit for using an incorrect *AB* within a following correct method.

Of those who attempted the question but failed to score, most were using an angle of 125 instead of 75 to find *AB*, although they could identify and use the cosine rule correctly. Those candidates who chose to use the cosine rule twice and had learned the formula as Cos $\vartheta = \ldots$ avoided the need to rearrange their equation and usually scored at least two marks easily. Even with a correct angle for *LAB* or *ABL*, many could not find the correct bearing, often not referring to the diagram to help with an idea of what the magnitude of their answer should be.

Question 25

(a)
Many attempted this part of the question successfully, with only a few making sign errors or attempting to combine as one incorrect fraction.

(b)
The main error in this part of the question was from assuming vector *AB* = **b** – **a**. Occasionally we saw a correct fraction, correctly using the given ratio, but then the direction was incorrect. A few struggled to simplify the fractions correctly.

(c)
This part of the question proved extremely difficult to the majority of candidates, perhaps the most challenging on the paper, with many blank responses seen. Centres could teach candidates that the first two parts will prepare them for part (c), and that they need to find two distinct ways to find vector *AX*, using their answers to part (a) and (b).

Candidates working at the highest grades who found two correct distinct paths, usually were successful in equating the components of **a** and **b**. Manipulating simultaneous equations involving fractions sometimes caused errors beyond this.

Question 26

(a)
This was generally answered very well. Occasionally a correct inequality was followed by just 4 on the answer line. Common with algebraic questions, we are unable to ignore subsequent working, where it shows misunderstanding.

(b)
Many candidates were able to find the correct critical values, but the correct region identified was far less common with $x > -2$ and $x > 3$ often seen. This usually led to being unable to score in (c). Candidates who drew a sketch to help with the correct region generally scored the final mark.

(c)
This was rarely even attempted, though very occasionally was awarded 1 mark. Incorrect answers in (b) generally meant being unable to score in (c). When a candidate earned this mark, they almost always had the compound inequality, but the $x < -2$ part was frequently omitted.

Pearson Education Limited. Registered company number 872828
with its registered office at 80 Strand, London, WC2R 0RL, United Kingdom