



Pearson
Edexcel

Examiners' Report
Principal Examiner Feedback

Summer 2024

Pearson Edexcel International GCSE
In Mathematics B (4MB1) Paper 02R

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 2024

Publications Code 4MB1_02R_2406_ER

All the material in this publication is copyright

© Pearson Education Ltd 2024

Introduction

In general, this paper was well-answered by the overwhelming majority of candidates. Some parts of questions did prove to be quite challenging to a few candidates and centres would be well advised to focus some time on these areas when preparing for a future examination.

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

- Showing clear working particularly when it is requested in the question
- Correct use of percentage profit formula
- Representing the combination of two inequalities on a number line
- Problem style questions within shape and space topics
- Transformations, particularly correct terminology for transformations
- Use of completing the square to find an inverse function
- Circle theorems

In general, candidates should be encouraged to identify the number of marks available for each part of a question and allocate a proportionate amount of time to each part of the question. In addition, candidates should also be advised to read the demands of the question very carefully before attempting to answer. It should be pointed out that the methods identified within this report and on the mark scheme may not be the only legitimate methods for correctly solving the questions. Alternative methods, whilst not explicitly identified, earn the equivalent marks. Some candidates use methods which are beyond the scope of the syllabus and, where used correctly, the corresponding marks are given.

Report on Individual Questions

Question 1

This question proved to be an accessible start to the paper. Part (a) was very well answered with the modal score being 2. The common errors seen were dividing by $(7+2)$ rather than 7, and dividing by 2 and multiplying by 7. A few candidates found the total of tables and chairs, 54, without attempting to find the number of tables and this was awarded one mark. In part (b) very few errors were seen. Some divided by the 'new' amount, 276, rather than the 'original' cost, 240. A small number did not give the answer as a percentage, writing either 0.15 or 1.15. In part (c) many candidates did not recognise that \$513 was 135% of the purchase price, so found 35% of 513 and either added or subtracted it to 513. Some who gained M1 for $\frac{513-x}{x} \times 100 = 35$ did not correctly multiply both parts of the numerator by 100, leading to an incorrect equation and value for x . In part (d) there were a small number of errors seen which fell into two categories: either using the wrong operation, i.e. dividing the cost in dollars by 0.95 or multiplying the cost in euros by 0.95 or they subtracted from the incorrect currency amount. There was also a significant amount of misreading in this question as some misread 735 for 732.

Question 2

Part (a) was well answered with a variety of methods being used successfully. Of those who did not gain full marks a reasonable start was made, and one to three marks achieved by calculating the internal and/or external angles of the hexagon and/or octagon. Part (b) was well answered with most candidates using one of the two methods as stated on the scheme. Of those that did not achieve any marks, this was usually due to adding the internal and external angles and equating this to 360 instead of 180.

Question 3

The responses to this question varied significantly. In part (a) most candidates gave a correct transformation of rotation although there were also candidates who stated the correct angle and centre but lost out on a mark for failing to state that it was a rotation. The angle of 90° was often given correctly but sometimes spoiled by the addition of the incorrect word 'clockwise'. Many failed to give the centre of rotation and there were many incorrect coordinates given for this. It is important to note that if 3 marks are given for the description of a transformation then 3 points should be made by the students. In part (b) most students gained both marks although some candidates had the triangle higher than should have been and were awarded one mark out of the two. There were many successful attempts at part (c) although, several candidates used an incorrect centre of enlargement. It was pleasing to see that part (d) was answered correctly by a significant number of candidates.

Question 4

The vast majority achieved full marks in part (a) with just a few candidates having the incorrect sign or starting to solve the inequality by adding 3 rather than subtracting 3. Part (b) was also well answered with the majority achieving full marks. A few gave $1 < x < 9$ or only found $x < 9$ for 1 mark. Very few attempted to solve both inequalities at once, which often led to M0. Part (c) was not well-answered with most candidates drawing 2 or 3 lines rather than a single line. Incorrect symbols and shading between two lines were often seen. The responses seen strongly suggest that more focus on representing the combination of two inequalities on a number line is required.

Question 5

Part (a) was very well answered, and it was rare to see a response that did not score both of the marks. In part (b) many fully correct graphs seen. A common error was showing a minimum point between $x = -2$ and $x = -1.5$. Not all candidates drew a curve through all their plotted points. In part (c) too few candidates drew the line $y = 2$ line. A few candidates joined the two ends of their curve, whilst others drew lines of various gradients. Some candidates lost the A mark, giving only two solutions. Where candidates clearly did not use the curve to gain their answer, they did not gain any marks here. While it may well be sensible to use their calculator to check their answer it should be obvious to the examiner that this is not where the answer originated.

Question 6

About half of the candidates managed to complete most of the Venn diagram correctly with some losing a mark for the missing or incorrect value for Potatoes only. Most of those that did not complete the Venn diagram did not account for the gardeners already accounted for in the overlaps of the diagram. The mark in part (b) was still available to those candidates who did not complete the Venn diagram correctly. Of those that did not score the mark, it was usually because they gave an answer of 2 or 8, 17. In part (c) common errors were to multiply probabilities together or to have a denominator of 80 instead of 48.

Question 7

Parts (a) and (b) were very well answered by the majority of candidates with only a few making slips with their calculations. In part (c) although it was a rare occurrence it was still disappointing when candidates calculated the discriminant incorrectly or were not totally successful at finding the inverse function (placing the components in the incorrect positions), given that the formula was given at the bottom of the page. Others interpreted the + sign as an \times , making the question more difficult as well as losing marks.

Question 8

Part (a) was surprisingly not well answered with many candidates only gaining one or two marks. Most listed five integers with a range of 7, often with a mode of 15. It was disappointing to see many examples of 16 in the middle of an unordered list but where it was not the median. Surprisingly, some omitted the mode of 15 from their list completely. In part (b) most candidates made a correct start by calculating 8×104 or 5×89 with only a few not subtracting these and hence failing to achieve the second mark. There were quite a few candidates then failed to divide this by 3 and hence lost out on achieving the final mark. Some simply calculated $104 - 89 = 15$ for which no marks were awarded. In part (c) many candidates did not have a clear understanding of frequency density, with 75 being divided by a class width of 4 being a common error. Some candidates found a probability of $18/29$ apparently by counting 1cm squares rather than finding the required numbers of parcels. These candidates were less likely to show any further working towards the full solution than those who found $90/145$ although a small number gained full marks for a probability of $(18/29)^2$.

Question 9

The first part of this question was well-answered, however the reason was often missing key terms and hence could not be awarded the mark. Part (b) leading on from part (a) was also well answered and various methods were employed with no one of them being more successful than the others. In part (c) it sometimes appeared that candidates were substituting numbers into formulas with little understanding of the problem. It was not uncommon for candidates to try using trigonometry, perhaps having the expectation that it would appear somewhere on the paper and hence must be here. Mixing up the labels and confusing the two radii were common errors. However, those candidates who were able to set their work out clearly and label their working correctly usually obtained the correct answer. Perhaps more work could be done on the presentation of work to help

students to organise their thoughts, along with the physical manipulation of 3D shapes to help candidates to develop their spatial awareness.

Question 10

Part (a) was well answered compared to the last year with very few errors, which were usually answers of 2 or 0 seen instead of -2 . Part (b) saw many correct answers with occasional arithmetical errors from some candidates. Part (c) was also well answered, again with occasional arithmetic errors from some candidates with the most common incorrect answers being $5/3$ or $-3/5$. Many candidates had success in part (d), but we saw some multiplying the two functions rather than substituting the output of $g(x)$ into $f(x)$. Some gained M1 for finding $g(24)$ but lost the A mark due to incorrect simplification. In part (e) a few candidates substituted in $x = 4$ rather than solve $gf(x) = 4$. Some candidates gained the first mark for a correct start, but then rearranged this incorrectly. These candidates were still able to gain a second mark if they gained a three-term quadratic and showed their working when solving the quadratic equation. Those who failed to show their working need to be made aware that they are not going to gain marks. Many candidates who gained all three M marks lost the A mark as they did not take account of the constraint that $x \geq 1$. Part (f), unsurprisingly was the least well answered part of this question with a considerable number of candidates gaining no marks, due to little or no knowledge of completing the square. Many attempts to use the quadratic formula did not include $-y$. Those that did sometimes failed to include brackets around $-y - 4$. Most of those who used the quadratic formula correctly recognised that only the positive solution was valid.

Question 11

A fairly standard, albeit demanding, question with some candidates failing to pick up any marks due to attempting to use the elimination method. Those who realised that they needed to use the method of substitution usually picked up at least two marks with the limiting factor being due to the incorrect expansion of brackets. When brackets were expanded correctly, candidates usually solved their quadratic equation by using the quadratic formula rather than factorising and generally went on to gain full marks. A common error was that candidates used the quadratic formula to find y but labelled it as x and then substituted these values into the linear equation to find y again.

Question 12

Many candidates failed to make a correct start on this question and struggled to convert $\sqrt[3]{25}$ to $25^{\frac{1}{3}}$

Several candidates incorrectly wrote the $\sqrt[3]{25}$ as $25^{\frac{3}{2}}$ whilst some converted the $\sqrt[3]{25}$ to a decimal or multiplied 25 by 35, all scoring no marks. Whilst many candidates scored full marks, a significant number lost the final mark due to arithmetical errors, usually failing to add 1 to the power to account for the factor of 5 in 35 or making the power of the denominator $4a + 1$ instead of $4a + 2$, or dividing $8a$ by $4a$. Candidates who attempted to initially work with powers of 25 instead of powers of 5 often had limited success and only gained one mark.

