Pearson Edexcel

Examiners' Report
Principal Examiner Feedback

June 2021

Pearson Edexcel International Primary Lower Secondary (iPLS)
Year 9 Mathematics (LMA11/01)

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General Comments

The paper this summer had a very similar level of difficulty to previous series, with many similar topics and questions being examined, although candidates' performance across the ability range was slightly weaker overall. However, the raw marks achieved were distributed across the full mark range, so the grade boundaries were set at similar levels to the previous series. Both sections of the paper had questions which collectively helped to differentiate effectively between candidates of different abilities.

The vast majority of candidates engaged with all questions and only a very small proportion questions were left blank. Any questions that were not attempted were generally towards the end of Section B, where there were more problem-solving questions and the topics being examined were more advanced, so there was no evidence to suggest that any candidates left question out because they ran out of time.

In general, candidates' work on algebra was not as strong as in previous series although the standard of responses on shape, space and measures questions has continued to improve. Again, questions on statistics and data handling seemed to challenge candidates the most so this may be a topic that centres want to focus on in preparation for future series.

Candidates overwhelmingly seemed to have a suitable calculator which will have allowed them to complete several questions in a fast, effective way. However, they also showed appropriate working in the vast majority of cases, which is pleasing to see as it enabled many candidates to earn method marks where their final answer was not completely accurate. Unfortunately, inaccurate answers were relatively common, often due to truncation or rounding errors and, in many cases, this was caused by overly severe rounding at early stages of calculations.

Candidates need to be made aware of the impact that premature rounding can have on the accuracy of their answers and should only use values that have been rounded to three significant figures, where necessary. Several candidates would have benefitted from writing the answers from their calculator display out in full before rounding or truncating, so that accuracy mark could be secured, even if their subsequent rounding was incorrect.

Section A

In the first section of the paper there were fifteen multiple choice questions, each of which had one correct answer and three incorrect distractors. The rationale behind each of the distractors is set out in the mark scheme so centres can see why answer is there, and what potential misconceptions candidates may have had. The lack of working out shown, and required, in Section A makes it impossible to know for definite which answers were correct because of accurate methods and which were due to good fortune.

As expected, questions at the beginning of Section A were completed more successfully than the questions towards the end. This was always likely to be the case as the difficulty of questions usually increases as candidates progress through the section.

However, there were exceptions to this pattern as Question 3 was very early in the paper but was completed less successfully than most other questions, while Question 10 was towards the end of Section A and was completed more successfully than any other multiple-choice question.

Almost all candidates managed to indicate their selected answer effectively, which allowed their work to be assessed by OMR. There were very few cases where candidates indicated more than one answer for a question (which meant that the mark was lost, even if one of the answers selected was correct) or where no answer was selected at all.

Section B

Section B of this paper featured seventeen questions, six of which had more than one part. Each question (or part) gave candidates the opportunity to earn one, two, three or four marks towards the overall total of 65 marks for the section. Marks were awarded for evidence of correct methods on each of the questions that were worth more than one mark. Specific details on each question in Section B can be found below.

Question 16

Part a was left blank by a surprising number of candidates and less than a quarter of candidates got it correct. Those who attempted it but failed to earn any credit often either plotted points on the line but without joining them up, drew a diagonal line joining -3 on each of the axes, or drew the graph of $x = -3$ instead.
Part b was attempted by a far greater proportion of candidates although less than half of them completely it correctly. Many of the incorrect answers gave a coordinate which would have produced a trapezium while a number of others gave a coordinate which was 1cm above, below or to the side of the correct answer.
Part c was completed well by many candidates although some clearly had no idea how to proceed with the question, with a minority finding the gradient of the line instead. Of those who scored one mark out of the two available, a significant number had the right method but had problems calculating with the minus sign. Otherwise, there were very few arithmetical errors and those who knew how to tackle this type of question showed good, clear methods.

Question 17

In Part a, the vast majority of candidates recognised that the first operation to complete was in the brackets (8-5). However, at this point, candidates diverged into two main groups. It was pleasing to see so many candidates performing the division correctly and then adding to give 20. The other main answer was 12, from adding 12 and 24, before dividing by the 3.
Part b was done well by a large proportion of the candidates with many using index notation to express their final answer (although this was not required). The 'tree' method was the most frequently used amongst those who secured both marks, although several other methods were seen and used successfully to obtain the correct answer. There were a small proportion of candidates who listed multiples or factors of 180, both of which attracted no credit. Those candidates who scored only one of the two mark available usually did so because of a single arithmetical error, which could have been addressed by checking their answer on a calculator.
A lot of candidates managed to get 8n for one mark on Part c, but relatively few gained full marks for a completely correct answer. Many of those who failed to score any marks found the difference but were not able to proceed from there.

Question 18

In Part a, the majority of candidates earned at least the method mark for using 10 as the numerator, or for correctly placing 10 and 11 in the table, although many used a denominator of 20 in their answer, rather than 11, and hence failed to secure the second mark. Almost all candidates who completed the table did so correct as there were very few arithmetic errors.

Most candidates gained the mark available in Part b for a reasonable attempt at a line of best fit although some of the lines were poorly drawn. Many candidates joined the lowest and highest points together which did not receive credit, while a minority of candidates joined the points, an approach which also yielded no marks.

Those that did draw an accurate line of best fit and the ones that joined highest and lowest points tended to go on to score the mark for Part c as well either by their answer being in the given range or because they read off the value correctly from their line. Some candidates lost the mark, despite a correct line of best fit, because they read the scale incorrectly.

Question 19

Part a was answered poorly by many candidates, primarily due to incorrect expansion of the second part of the bracket, writing -24 instead of +24 as their last term. This scored no marks. When the brackets were expanded correctly, a huge proportion of candidates moved on to collect terms accurately and find the correct answer. Where there was an error in collecting terms, it usually involved an incorrect sign in the 3k term.

Part b was generally well done by a huge number of candidates, although there was a significant minority who had no idea where to start. Of those who did, most were able to get at least the first mark even if there was a sign error. The most common technique was FOIL but, in comparison to previous series, an increasing number used 'w(w-5) + 4(w-5)' correctly. Having removed the brackets, the most common error occurred when simplifying -5w+4w, as this often resulted in w (rather than -w).

Part c produced a pleasing number of correct solutions from candidates who were clearly well versed in algebraic manipulation. However, there were many others who obvious did not know to square both sides first. Therefore, a large number attempted to multiply by 5 first in an otherwise sound attempt. Of those who correctly squared first, a small minority went on to wrongly insert brackets, leading to (5p)2 = 7q.

The first step in Part d was crucial and most candidates accomplished this successfully then proceeded to the correct answer. However, there were some who were unable to expand 5(2x + 5) correctly and hence only achieved one mark. A significant number showed the intention to multiply by 5 but failed to multiply all terms by 5 and thus failed to make any progress. A smaller number had problems with rearranging leading to sign errors on one or both sides, so 8 was a common incorrect answer.

Part e was the simplest question to answer in this section and well over half of the candidates did so correctly. The most common incorrect answers were y and 0 although a fairly significant number of candidates did not attempt the question at all.

Part f was done very well by most candidates. The most common starting point was to simplify the numerator by adding powers although some candidates stopped at this point and were awarded only one mark. There were some instances where a lack of knowledge was evident and candidates simply tried to multiply and divide the powers, giving a common incorrect answer of z to the power 6.

Question 20

Over half of the candidates were able to correctly name the chord shown in Part a, although a surprisingly large number did not attempt the question at all. Of those who attempted the question but failed to earn the mark that was available, the most common incorrect answers were diameter, circumference and segment. Candidates were not penalised for inaccurate spelling, as long as their intention was clear, but it was pleased to note the number of answers that were spelt correctly.
Many candidates seemed to struggle more than anticipated in Part b, with only around a third of the marks that were available being earned overall. Some left it blank, whilst others got the formula for area and perimeter mixed up. In Part (i), many candidates used 12cm as the radius and some found the area of a full circle. In Part (ii) many found the perimeter of a full circle and considered that to be the answer. Those who found the length of the curved section very often failed to add the 12cm of the diameter to complete the perimeter. Many candidates would have benefitted from communicating their strategy more clearly, to break the problem down into the steps required, rather than trying to perform a single calculation that would lead them immediately to a correct answer.

Question 21

Given that this was a relatively straightforward question, it was not done particularly well by several candidates, with considerably less than half getting it correct. Some knew the formula for speed but were unable to rearrange it, whilst others were able to do this but did not convert the time into hours accurately. Several candidates used 2.15 hours while a small minority worked with 135 minutes, but then failed to gain any marks unless they divided their final answer by 60.

Question 22

The answers to this question were very mixed with only about half the candidates scoring full marks. Many subtracted the total of the known angles from 180 and divided the answer by two to get 10. Several assumed (incorrectly) that the unmarked angle was 90 degrees and went on to give angle c as either 130 (if they acknowledged 360 as the correct sum of angles) or 90 (if not). Those who scored the first mark almost always went on to score full credit and showed their correct methods clearly. These included a relatively high number of candidates who divided the kite into two triangles with a vertical line, which was an unexpected but efficient way to find the correct answer.

Question 23

Those that knew what to do on this question tended to score full marks by successfully finding the midpoint, multiplying by the frequency and completing the question accurately with clear working out shown. It was pleasing that very few responses were seen where the method was correct but values other than the midpoint were used. Some candidate divided by 4, presumably because there were four groups. A number of incorrect answers scored no marks as the candidates seemed completely unfamiliar with this type of question. Of these, several simply added the values that can be seen in the height intervals and found the mean of those numbers.

Question 24

Marks were awarded independently for the correct lower and upper bound and only around a fifth of the marks available were secured by candidates. This was generally answered well by candidates who had some knowledge of this topic although there were some who stated bounds for rounding to the nearest whole number while others gave the upper bound as 849 999 999. However, many candidates left the answer lines blank or showed no understanding of the topic.

Question 25

Responses to Part a were very mixed, with around half of the answers being correct. Several were completely correct, demonstrating candidates knew to find the difference and divide by the original value. The method shown in the mark scheme was the most popular and successful of the methods seen although answers of 124 or 1.24 but not converted back to 24% were also common. However, some candidates did not seem to understand what was required and simply stopped at finding the difference in price and chose that as their answer.

Part b also saw around half of the marks being secured by candidates. When the multiplier method (1.16 and 0.8) was used, it was almost always led to a fully correct answer. Some gave the bookshop with the higher price as their answer which may mean they misread the question or may be a lack of appreciation of place value (thinking that 20.3 was less than 20.28). Getting to those two correct values was a problem for some, who showed how to find the increase/decrease but then failed to add/subtract to find the two final prices. When a single method mark was the outcome, it was almost always for finding 0.8 x 25.35 but usually by finding 20% then subtracting. The 16% increase proved to be more problematic and it was often left with 16% of 17.50 being found but no further progress being made.

Question 26

Candidates generally recognised this as a question requiring the use of Pythagoras, but only just over half of them did so correctly. A significant number failed to recognise that the shorter side needed to be calculated so added the squares rather than subtracting. Others had the correct calculation but subtracted before squaring. In correct solutions, methods were shown well through clear working. However, there were a good number of candidates that used the 21 and 8 to find what they thought was the area and a handful who unsuccessfully tried to use trigonometry.

Question 27

This was a straightforward question for those candidates who knew what to do and they did it with commendable accuracy. For other candidates however, it seemed completely unfamiliar and many clearly did not know what to do. The majority knew that arcs were needed, but some arcs were not appropriate, even when the correct bisector had been found by some other method. Some bisected the line BC, others drew arcs from points A and C or simply guessed where the bisector might be. There were several freehand arcs seen, suggesting that some candidates did not have access to a pair of compasses.

Question 28

This was another question where the responses were very mixed. There were many fully correct answers from candidates who worked confidently and concisely, although a few left the answer in the form 75900. However, many candidates did not seem to understand the concept of standard form at all. Some did not know how to add two numbers in standard form while others added the two numbers but could not convert the answer back to standard form correctly. It was surprising to see the number of incorrect answers, given that this could be done relatively easily on a calculator.

Question 29

Very few candidates gained full marks on this question. Many did not attempt it and left it entirely blank, while others only gained one mark for finding the new range. The next step was to find the mean of the ten ages, but most did not attempt this. It is unclear whether this is due to candidates' inability to solve this type of worded problem, or whether it is due to a lack of knowledge and understanding of statistical measures.

Question 30

Hardly any candidates produced a fully correct response to this question, as the vast majority who engaged with the question misinterpreted the information given. Many took 14m to be the length of one side of the field, or the area of the rectangle, which led to a 7 x 2 rectangle. When an acceptable rectangle was drawn, 5 x 2 was the most common one seen, which then led to an incorrect answer of 5. Even when candidates reached a correct answer, they often did so by choosing one rectangle (3 x 4) rather than exhausting all possibilities and then dismissing the other acceptable rectangles.

Question 31

The candidates who correctly identified that this question required trigonometry tended to use the tangent correctly, although some candidates did not realise that the adjacent length was 5cm (and not 10cm) so were only able to score one mark. Others who realised it was 5cm and used the tangent ratio usually did so correctly and went on to score full marks. A number of responses showed the candidates had no idea how to attempt this question though, which suggests that they were not familiar with trigonometry. The amount and presentation of working shown was usually a good indicator of the quality of responses, with the best answers coming from clear, well-structured methods.

Question 32

This proved to be the most challenging question on the paper, with very few responses scoring full marks. A small number of responses found the correct combined ratio, and hence scored one mark, but solutions rarely went any further than this. When a correct answer was found, working was easy to follow and logical. However, most responses contained disorganised arithmetic that attracted no credit and suggested that the candidates had no idea of what was required.

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