edexcel

Principal Examiner Feedback

November 2014

Pearson Edexcel GCSE
In Mathematic A (1MA0)
Higher (Calculator) Paper 2H

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

November 2014
Publications Code UG040309

GCSE Mathematics 1MA0_2H
Principal Examiner Feedback - Higher Paper 2

Introduction

Far fewer able students took this paper than previous series, perhaps due to the new rules on re-sits. As a result performance overall was weaker. This was particularly the case with questions near to the end of the paper, where there were few attempts at the questions. Performance on unstructured questions was also weaker, showing less strategy in coming up with secure procedures for solution, and too many attempts that resembled trial and improvement approaches.

The inclusion of working out to support answers remains an issue for many; but not only does working out need to be shown, it needs to be shown legibly, demonstrating the processes of calculation that are used. There were too many instances in this paper where working was set out in such a disorganised way that examiners found it impossible to identify a chosen route of solution by the student, in order to award method marks.

Report on individual questions

Question 1

Full marks were gained by most, with 120 × 3 shown in working usually followed by the correct answer.

Part (b) was not done as well, with 2.5 frequently seen but a significant number did 300+300+150. Again with simple errors evident.

Question 2

Both parts were answered well. There were only a few in part (a) who gave incomplete references to correlation rather than a description of a relationship.

A mark was sometimes lost in part (b) where poor lines of best fit were drawn, or the scaling was misused.

Question 3

In part (a) the most common error was to assume $3g$ meant $3+g$, surprising on a Higher paper. Negative numbers caused problems for some. In contrast part (b) was usually well answered.

Brackets were usually multiplied out correctly in part (c), with most errors caused by incorrect simplification, usually leading to $7y+16$ and $7y+4$ because of an inability to process $-10-6$.

In parts (d) and (e) it was disappointing to find a significant minority who either multiplied or divided the indices (rather than adding and subtracting).

Question 4

Many failed to get the correct answer in part (a), with shapes incorrectly oriented and drawn in a variety of places on the grid. A common error was to just draw a reflection in the x axis.

In part (b) frequent errors included an inability to count squares, and giving the vector as a coordinate, or without brackets at all. Centres need to remind students that descriptions in words are not acceptable as an alternative to vector notation. Some could not remember the word “translation” and used “transformation” instead.

Question 5

The most common error in part (a) was in treating the 0.4 as 0.04 when they added.

In part (b) most showed an intent to calculate 125 × 0.16 but too many attempted this using non-calculator methods, even some who were clearly using a calculator in other questions. Some chose to use a colour other than green for 0 marks.

Question 6

Predictably a minority of students mixed up units, and used exchange rates incorrectly (usually by dividing instead of multiplying or vice versa). Of those who did so correctly, many then performed an incorrect subtraction, for example finding the difference between 2.90 euros and £2.50

Students who failed to provide the correct monetary units with their numerical answer lost the final mark.

Question 7

Many were able to give the correct answer of $4n-2$ in part (a), with $4n$ or $2n+4$ being the most common incorrect answers.

Irrespective of the quality of response in part (a), many went on to provide a perfectly reasonable explanation in part (b), many by continuing the sequence up to 86. Incomplete answers referred just to the fact that they were even numbers, or had to include 2,6,4,8.

Question 8

There were some good polygons presented for marking. Commonly they were spoilt by plotting elsewhere other than at the midpoint, or by joining the points freehand rather than with straight line segments. The many bar charts drawn earned 0 marks; they had to be superimposed with a polygon or plotted points before the award of any marks could be considered.

Question 9

It was encouraging to see many correct solutions to this question, including an acceptable concluding statement. There were many different approaches using a variety of techniques. The two most popular methods were finding a percentage to compare with the 94%, or finding the actual number of students that needed to be late to meet the target. Weaker students became confused as to what they needed to find to make a comparison, some finding 94% of 1092.

Question 10

The method of solution to this question was known by most, who were usually also seen to be substituting correctly into the equation. The most common errors were failing to consider a trial between 5.1 and 5.2, or a failure to give the final answer to 1 decimal place.

Question 11

Those students who chose to find the area instead of the circumference could make little headway with this question. Those who did so usually used the correct radius, and could be awarded the first 2 marks. Since there were many different ways in finding the answer to this problem, legible working out was essential, particularly as this was a QWC question. The most common method was one in which the number of people who could sit round one table was worked out, then 12 tables, leading to a comparison with the 90 people stated in the question.

Question 12

A majority of students were able to find a set of values to plot and join to make a straight line. It was a disappointment to find only a minority could give an acceptable set of axes. Non-linear scales, missing x/y labels, axes on the perimeter of the grid were all common errors that were unexpected on a Higher paper.

Question 13

This was the first question on the paper where a significant minority chose not to attempt the question. It was disappointing to find so many who could not divide up the cross-section face correctly or merely multiplied 15×2×10. Too many worked with surface area rather than volume. There was some credit given for working with rates, where this was shown unambiguously in working.

In part (b) there were many correct answers, with B given as the most common incorrect answer.

Question 14

Those who chose to work with multipliers regularly failed to score in this question, mainly due to a poor choice of multiplier, for example 0.4 rather than 0.04, or combining the 4% and 1.5%. 2.5^2 was also seen regularly. Many chose to use simple interest methods and therefore gained few marks, if any. Those who recognised this as compound interest were usually able to work out a correct figure for one of the banks, but both calculated correctly was rare.

Question 15

Only a minority of students chose to derive a set of simultaneous equations to solve. The majority of students used a trial and improvement approach to the solution, which could only be credited on giving the correct answers. Common incorrect answers scoring 0 marks were £7.50 (from 30÷4) and £5.50 (from 22÷4).

Question 16

Again there were quite a number of nil attempts. However, most students identified that they needed to use Pythagoras as a first step, and AC was usually found correctly. It was rare to find students proceeding further in a logical way, since many incorrectly assumed that CBD or ABD was 45°. Any attempt at using trigonometry was usually based on an incorrect side or angle. No student used a similar triangle approach.

Question 17

There were many attempts at this question where students failed to show any knowledge of circle theorems, but rather made false assumptions about angles in order to provide some basic work. This included assuming there were isosceles triangles, where there were none. Some found ABE to be 55°, but without the knowledge that ABC was 90° this got them nowhere useful.
Centres need to remind students that when working with geometry problems they need to either write the angles on the diagram, or if only presented in working, these workings need to clearly show which angles are being worked with.
Few students gained full marks.

Question 18

This was a surprising question to mark. Part (a) was not well answered, yet in part (b) far more students gained full marks for the histogram than would normally be the case.

In part (a) there were problems with finding appropriate midpoints for the 12.5 and 17.5 values. Many divided by 5 instead of by 50.

In part (b) weaker students presented a frequency graph.

Question 19

Part (a) was usually well done with the majority gaining full marks. Weaker students gave incorrect values on the right hand branches, perhaps reversing the 0.3 and 0.7 on the lower set.

In part (b) many gained a single mark for 0.3×0.7 ($=0.21$), but some attempted to add these values. Students who knew to multiply two sets of values usually went on to gain full marks.

Question 20

The most common error was in using -5 instead of 5 at the front of the formula. Another common error was in copying the formula but not extending the division line under the –b, or in performing the calculations in the wrong order. Too many attempted T&I or factorising methods but failed to show sufficient progress to gain any marks.

Question 21

From this point on, a significant number of students failed to attempt these later questions in the paper. In this question many incorrectly assumed ABC was 90° and tried to use Pythagoras. Some tried to use Sine Rule but frequently substituted incorrect values; few considered the need to use Cosine Rule.

Question 22

In part (a) many did not factorise and just cancelled from the initial equation, gaining no marks. Those who did factorise frequently made mistakes in cancelling.

In part (b) the few that made an attempt did so in a very haphazard way. Examiners had great difficulty in identifying exactly what students were trying to do; there were many cases of ambiguous working through students merely showing contradictory examples of manipulation; some correct, some incorrect. Putting the left hand side over a common denominator was the most successful approach, with some going on to show some skill in isolating the m terms, and some even factorising the m terms once brought together

Question 23

Most commonly the issue of bounds was ignored and the initial values were used in calculations, attracting no marks. A few used bounds given to the wrong level of accuracy. For some the only mark was for successful conversion into km/hour, but only where this was clearly shown.

Summary

Based on their performance on this paper, students should:

- be aware that in order to gain the highest grades proficiency must be shown across the whole paper, including the easier questions in the first half of the paper.
- present their working legibly and in an organised way on the page, sufficient that the order of the process of solution is clear.
- write their answers to full accuracy when using a calculator and continue to use their answer as such in multi-step problems, addressing requests for rounding only at the final stage, and after a completely accurate answer has been demonstrated.
- include working out to support their answers.
- avoid attempting trial and improvement approaches as these commonly gain no marks.

Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:
http://www.edexcel.com/iwantto/Pages/grade-boundaries.aspx

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