

Principal Examiner Feedback

November 2012

GCSE Mathematics (2MB01) Higher
5MB1H (Calculator) Paper 01

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GCSE Mathematics 2MB01

Principal Examiner Feedback – Higher Paper Unit 1

Introduction

Candidates appeared to be able to complete the paper in the allotted time.

Candidates were showing their working out well. In starred questions most candidates realised that they needed to show numerical working and very rarely offered unsupported worded responses.

Candidates need to practice writing concise sentences where questions required a sentence to confirm their result.

Candidates were, in most cases, showing their working out well and, given the allowance of a calculator, were rarely making arithmetic errors though rounding errors did occasionally lead to incorrect answers and lost marks.

Candidates were generally attempting all questions so it was rare to see blank responses.

There was evidence to suggest that some candidates did not have a calculator, protractor or a ruler.

Report on Individual Questions

Question 1

This question was attempted by almost all candidates with most candidates scoring full marks. Those who lost marks usually gained B1 for the diagram, having only made one error or omissions. Very few candidates failed to sort the leaves. Most gained B1 for a key. A few candidates ignored the diagram given, split the stem into two groups and wrote double digit numbers in the leaf.

Question 2

Part (a) was attempted by almost all candidates with most scoring full marks. A few candidates demonstrated the correct method but poor addition or subtraction meant they only gained M1. Very few, weaker candidates were incorrectly giving the answer $\frac{1}{4}$

Part (b) was attempted by most candidates with most scoring full marks, however, candidates were slightly less successful than in part (a).

Common errors included misreading the question and using their answer to part (a) instead of 0.12 for the probability. A few thought that the answer needed to be a probability and continued to divide their answer by 4, 50 or 100. Despite the allowance of a calculator, some candidates were unable to work out 0.12×50

Question 3

This question was well attempted by most candidates with many gaining full marks. A common mistake was the division by 4 instead of 50, either $328 \div 50$ gaining M2 or $50 \div 4$ gaining M0. Other common errors were the use of 4 for the mid-value of all groups gaining M0 and less frequently the use of the lower or upper bound instead of the mid-value. Despite the allowance of calculators, many candidates made computation errors and often when they were using the correct method so only gained a maximum of M3. Another common incorrect answer which often followed some correct working was $4 < w \leq 8$, the modal group.

Question 4

This question was attempted by almost all candidates with most scoring full marks and those that did not usually gained M1 for one correct angle. Candidates rarely forgot to label the pie chart and in most cases labelled the angles as well as the require type of cat food. Candidates often did not show their working for the angles which, especially in the cases where candidates did not have a protractor could have earned them M1. Weaker candidates failed to use a ruler which sometimes led to angles outside the tolerance.

Question 5

Part (a) was attempted by almost all candidates with very few incorrect responses seen and the incorrect responses that were seen related to the topic such as no correlation and negative.

Part (b) was attempted by most candidates with most scoring full marks for an answer in range. Of the candidates whose answers were outside of the range the majority gained the M1 for a line that could be used as a line of best fit. The most common error was to incorrectly read the horizontal scale counting one square as one unit and reading at 48 and not 44 which usually led to answers above 54. Some candidates, who gave an answer just outside of the range, did not show any indication of how they arrived at their answer so, even though they were probably using a correct technique, they could not be awarded any marks. It's important in this type of question for candidates to show how they used the diagram.

Question 6

This question was attempted by almost all candidates with most achieving M3A1 or M1. The candidates that presented their answers in a table were the most successful and often gained full marks. Almost all candidates gained M1 for calculating the total number of male students as 84, but did not know how to get 35, the total number of students studying graphics and textiles. Where a table was not used, working out was often poorly presented and difficult to follow.

Question 7

This question was attempted by most candidates but many failed to gain any marks or only gained M1 for equating 96 to $\frac{3}{5}$

The most common error was to equate 96 to $\frac{2}{5}$ which led to 38.4 which they rounded to 38 and added to 96 to get 134, these candidates usually gained M0M0A0 though a few also had 96 equated to $\frac{3}{5}$ in their working to gain M1.

Other candidates, who only gained M1, correctly calculated 32 or 64 but did not realise that they needed to multiply the 32 by 5 or add the 64 to 96. Candidates rarely used ratios to solve the problem and when they did often incorrectly used 5 for the female shares.

Question 8

This question was well attempted by almost all candidates with almost all achieving at least M1C1. Most candidates scored full marks and presented their working out in a clear, easy to follow way with headings in appropriate places. Some also clearly marked the correct values in the table before attempting the working out which helped them to gain full marks.

Common errors for weaker candidates included adding in ski and boot hire for Joan, incorrectly writing $78+52+165\times 2$ hence only doubling the lift pass price when typed into their calculator or consistently using the child's price for Joan or the adult prices for the children. Better candidates were able to gain the initial method marks but then either lost the A1 mark as they were unable to calculate 3% or used an incorrect method for finding percentages.

Common incorrect methods for finding 5% and 3% were $\div 1.03$, $\div 1.05$, $\div 3$ or $\div 5$. Many preferred to calculate the percentage reductions in two stages rather than using $\times 0.95$ or $\times 0.97$.

More candidates made errors calculating 3% than 5%. Very few candidates failed to indicate clearly which shop was cheaper though a few just wrote 'shop B' at the end of their working out which is ambiguous.

Question 9

Part (a) of this question was attempted by almost all candidates with most candidates gaining the easier mark by correctly stating that Nathan only asked women. Most candidates then went on to say that he was in a DVD shop, repeating the information in the question, but many did not explain why this was biased nor suggest the need to ask people in other locations.

Again also all candidates attempted part (b) of this question however they were usually more successful in this part than in part (a) and correctly identified the overlapping boxes and the need for a more than 20 box.

Common errors included 'there is no time period' and 'there is no box for zero' showing that candidates had learnt the common responses but failed to relate them to this particular question. Others incorrect responses included 'he needs more than four boxes' and 'the question isn't detailed enough', however, in many cases these were accompanied by a correct response so the candidate still gained B1.

Question 10

This question was well attempted but only the most able candidates gained full marks. Many candidates scored M1 for $5x$ or $7y$ though these expressions were often found in a jumble of algebraic expressions. Common incorrect responses included just $5x+7y$, $\frac{(x+y)}{12}$ and $\frac{5x+7y}{2}$

Weaker candidates used $\frac{1}{5}$ and $\frac{1}{7}$ with no letters, described a process, made up numbers to use or wrote $12xy$.

Question 11

This question was attempted by almost all candidates with many candidates gaining full marks and those that did not, usually gained M1 for calculating 68

Candidates were more often than not using the concise alternative method of 1700×1.04^2 and it was rare to see this followed by an incorrect answer. Less applied the two stage method but were equally successful.

Common errors included the use of 1.4 instead of 1.04, subtracting the 4% and, of course, calculating simple interest instead of compound, though this did mean they could still gain M1.

Arithmetic was good on this question with few rounding errors seen. Almost all candidates found the value of his investment and not just the interest, though where candidates did only find the interest they were usually able to gain B2.

Question 12

This question was well attempted with most candidates filling all the boxes with a letter, however, only the most able achieved full marks. Candidates that achieved M1 usually got one of F, A, C or D correct. Weaker candidates used letters more than once.

Question 13

Part (a) was attempted by most candidates of whom many showed their full working out and were able to attempt the correct method for stratified sampling hence achieving M1A1, however, many of these failed to gain the B1 mark as they gave the answer 20, 26, 15.

Another common incorrect response was 19, 26, 15. Other incorrect responses followed from errors in rounding or use of 50 instead of 60. Weaker candidates gave the answer 20, 20, 20

Part (b)(i) was also well attempted but most failed to gain a mark with only the best candidates correctly stating 'equal chance' or equivalent. In most of the incorrect responses candidates were repeating the word 'random' or using equivalent words such as 'without bias'. Some candidates used the phrase 'even chance' which in probability means $\frac{1}{2}$ so is ambiguous so could not be awarded a mark. Others described a process for selecting a random sample.

Part (b)(ii) was well attempted but very few candidates gained B1. Candidates were able to describe a process for selecting a random sample generally but did not relate their response to Priya and did not state a limit as to how many she should select i.e. 60 or their answers to part (a).

Question 14

Part (a)(i) was well attempted by most candidates of whom many achieved B1, however, reading the scale incorrectly or not realising there were 19 items of data often led to a nearly correct but B0 answer.

Part (a)(ii) was also well attempted and candidates scored the full range of marks. Many realised they needed to draw lines at 5 (4.75) and 15 (14.25), went on to get 26 and gained full marks, however, candidates frequently used incorrect method. Some were using $(19 - 1) \div 4$ to get the position of their quartiles and read at 13.5, others were reading values above 5 and 15 or using the median as one of their values. The weaker candidates gave answers of 10 $(15 - 5)$, 9.5 $(14.25 - 4.75)$ or 50 $(75 - 25)$.

Again part (b) was well attempted and candidates scored the full range of marks.

Even candidates who failed to gain full marks in part (a)(ii) were able to calculate Mr Wilson's IQR as 36 and correctly compare it to their answer to (a)(ii) for full marks.

Candidates who failed to score any marks usually incorrectly read the scale so neither 64 - 28 nor 36 were seen for B1. Candidates who scored B1 usually also scored C1 though some over complicated the question and tried unsuccessfully to interpret their values which had they stated first which IQR was bigger could still have gained the mark. Weaker candidates stated that Mr Wilson's marks were higher so did not compare the IQRs, compared the quartiles individually or simply stated the quartiles for Mrs Angus and Mr Wilson.

Question 15

Part (a) was attempted by most candidates, though it was rare for candidates to gain full marks their attempt did seem to be better than in previous papers. The most common incorrect responses were failing to label the vertical axis 'frequency density', failing to give a key or drawing the last bar the correct height but from 11 to 14 instead of 11 to 13.

Another common incorrect response was drawing the last bar at the same height as the first. Weaker candidates drew bar charts and in a few cases stated a key but then built their bars using whole squares so their bars were not rectangular.

Part (b) was attempted by most candidates and both candidates who gained full marks in part (a) and those who gained no marks in part (a) went on to gain B1C1 in part (b).

Most candidates who correctly found 49 went on to gain B1C1 by stating clearly 46 for Monday and that Avi was incorrect. A few misread the question and wrote Avi is correct even though they had 46 and 49.

Candidates who did not calculate Tuesday as 49 usually had an incorrect method or their method was insufficient for them to demonstrate they could have arrived at the correct answer, hence scored B0. The weaker candidates simply counted the squares or gave the answer 14.

Question 16

This question was well attempted though few candidates scored full marks. Those that drew a tree diagram were more successful. Most gained M2 for multiplying two correct fractions usually $p(RB)$ or $p(BR)$ but did not go on to add their probabilities. Most realised that the pen was not replaced so even weaker candidates wrote probabilities with a denominator of 9 though they often could not multiply them or the numerators were incorrect.

Candidates that did not realise that the pan was replaced could have gained B1, however, they often did not arrive at $\frac{48}{100}$ as their process was incomplete.

Candidates that attempted the question by calculating $p(RR)$ and $p(BB)$ often forgot to subtract their answers from 1 and hence only gained M2.

Despite the allowance of a calculator many candidates were very unable to add and multiply fractions correctly. A few candidates converted their fractions to decimals but premature rounding led to an answer of 0.52 so, provided they had shown their working out, they could only gain M3

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