



General Certificate of Secondary Education

Mathematics (Modular) 4302
Specification B

Module 3 Foundation Tier 43003F

Report on the Examination
2007 examination - March series

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General

The paper was found to be accessible though candidates found some aspects of Section B quite difficult, even though there were more questions in this section which were not set in any context.

The Principal Examiner would like to make specific mention of the build-up method seen so often in percentage questions. This can be an effective method in certain types of question but some candidates seem to use it in situations in which it is a very inefficient method. Candidates can only pick up method marks if the method is complete and correct and by its very nature, the build-up method, if not successful, will probably be incomplete. There is clear evidence that students who attempt such methods are far less successful than those who use other more appropriate methods to calculate with percentages.

Candidates who fail to show working penalise themselves by not doing so, giving the examiner no choice but to award zero when the answer is incorrect. Those who did show methods were able to pick up significant marks along the way, even if their computational ability then prevented them from obtaining the correct answer.

Topics that were done well included:

- rounding
- finding a fraction of a number
- using digits to make numbers
- simple arithmetic
- ordering numbers.

Topics which candidates found difficult included:

- comparing a fraction with a percentage
- calculating with percentages
- long multiplication
- rounding to one decimal place
- arithmetic with fractions
- percentages in the context of tax.

Questions 1 – 3

These early questions provided a good source of marks for most candidates.

Question 4

The majority of candidates knew how to work out $\frac{3}{10}$ of 40 and were successful. Some candidates thought that they were required to find $\frac{7}{10}$ and did this instead or subsequently. A few of the weakest candidates calculated $40 \times 10 \div 3$. In part (b) very few candidates understood the requirements of the question. Most thought there was a link back to the number of sheep in part (a) and attempted to explain that there were either too few or not enough animals for $\frac{2}{3}$ to be cows. Some found $\frac{2}{3}$ of 40, showing it wasn't a whole number but then proceeded to work with that number as though there was no issue with a non-integer number of cows.

Question 5

Many candidates failed to show their working fully in this question. There were quite a few answers of 8 or 9 seen, but with no working these could gain no credit. Common errors were $32 \times 28 = 896$, $\frac{28}{32} \times 100 = 87.5$, $32 - 28 = 4$ and $25\% = 8 + 3\% = 11$. The build-up method was rarely successful on this question.

Question 6

Candidates who calculated the number of sweets were usually successful in working out $\frac{1}{4}$ of 600. They generally found $\frac{5}{8}$ of 600 a more challenging calculation. A number divided 600 by 8 to get 75 but failed to multiply by 5. However, some did manage to find that Kerry's share was 75 sweets. Only a few went on to express this answer as a correct fraction of 600, with a common error being to state it as $\frac{3}{4}$ (presumably from 0.75). There were a few very good solutions found by adding fractions although the majority that attempted to add $\frac{1}{4}$ and $\frac{5}{8}$ lacked the necessary skills to do so correctly. A small number of correct solutions from drawing a diagram were seen.

Question 7

In part (b) many candidates thought that rounding to one decimal place involves moving the decimal point, so solutions of the form 563.14 were not uncommon. A few candidates rounded up to 56.4.

Question 8

Unfortunately, most candidates thought that the answer was obtained by multiplying 4.15×5 . Weaker candidates found $4 \times 5 = 20$ and then added a bit on for the extra 15 minutes or stated that they needed $\frac{1}{4}$ of 5 but didn't know how to work it out. In part (b) very few candidates were able to work out that Shelley's rate of pay was £7.50. Many thought it was £10. There were unclear and unsuccessful attempts at a build-up method which almost always gained no credit. A few candidates tried to work out how much Paul would earn by dividing Shelley's pay by two and working backwards.

Question 9

The most common incomplete answer was from candidates who worked out the new price as a percentage of the old price or candidates who calculated the difference of 50 pence but could go no further. There were many attempts at build-up methods but these rarely scored as they were incomplete or unclear. Many candidates gave an answer with no method shown. Some candidates calculated 4% of £3.50.

Question 10

Most candidates found this question to be a good source of marks with all parts being answered successfully by the majority of candidates.

Question 11

Many candidates scored one of the two marks in part (b) for getting an answer between 100 and 200. Unfortunately arithmetic slips were prevalent and prevented most from getting full marks. Incorrect short multiplication was a common method in part (c), as was $30 \times 20 + 6 \times 4$. Those that used the traditional long multiplication method were often penalised for a conceptual error. Candidates that used the grid (Napier's bones) method often scored the two method marks.

Question 12

Most candidates indicated that they were using the correct method in part (b). However, arithmetic slips were extremely common. The most frequent errors in method were $35 + 6 = 41$, $10 \times 5 - 6 = 44$ and $7 \times 5 - 3 = 32$. In part (c) many candidates scored full marks. Some were confused over the 2 points lost for 1 wrong answer, so 9 right, 2 wrong and 8 right, 2 wrong were seen frequently. Weaker candidates worked back from a full score of 50 stating that $3\frac{1}{2}$ were wrong. A few candidates were very vague, saying that "some were incorrect".

Question 13

Candidates scored very poorly on this question. In part (a), misconceptions were common with answers such as 'percentages are always bigger than fractions' or attempts to compare 22% remaining with 1 part left over. Quite a few candidates had a feel for the relative size of the numbers with answers stating that 78% was just over $\frac{3}{4}$ or $\frac{7}{8}$ is around 90%. Unfortunately, they failed to demonstrate an appropriate mathematical response. In part (b) there was again a lack of arithmetic competence with some candidates who understood the method unable to gain the mark because they didn't know their multiplication tables. Some showed conceptual errors by inverting the second fraction before multiplying and getting an answer of $\frac{27}{16}$ or attempting to find a common denominator as if adding. As poor cancelling was not penalised, candidates held onto their mark once they had gained it.

Question 14

Many candidates did not attempt an approximation and therefore did not score. They simply calculated 7.9×7.9 or even 7.9×2 . The few that did use an approximation of 8 often worked out 8×2 instead of 8^2 . Some felt it necessary to take an extra bit off from their approximation to make it closer to the actual answer.

Question 15

For part (a), many candidates knew that they needed to work out $80 \div 20$, although a worrying number thought that this was 40. Some thought the solution could be found by 80×20 . Others attempted scaling and were rewarded for one correct attempt even if incomplete. Some candidates appreciated the need for $24 \times$ the answer to part (a) when attempting part (b), but then could not do the arithmetic. Others used the fact that the snail did 80 metres in 20 hours and found an extra 4 hours.

Question 16

Disappointingly, the majority of candidates worked out $8000 \div 5$, $8000 \div 3$ and $8000 \div 2$. Many stated correctly that there were $5 + 3 + 2 = 10$ parts but then didn't use this result. Others guessed how the money should be divided. Those that knew the correct method usually got the correct final values.

Question 17

Many candidates attempted 20% of £28000. Some tried to use the figures given in the example. A few reached £23000 but could go no further. There were very few correct answers and lots of blank scripts for the question.

Mark Ranges and Award of Grades

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