



General Certificate of Secondary Education

Mathematics (Modular) 4302

Specification B

Module 3 Higher Tier 43003H

Report on the Examination

2007 examination - March series

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Set and published by the Assessment and Qualifications Alliance.

The paper was found to be accessible particularly in the early parts of both sections.

Candidates who failed to show working were penalising themselves by not doing so, giving the examiner no choice but to award zero when the answer is incorrect. In particular if a question states 'You **must** show your working', then this is a requirement for full marks.

Candidates who use an additional sheet of paper when they have used up the space given for the working in a question are strongly advised to clearly show that previous attempts at a question should be ignored in favour of the attempt on the supplementary sheet. There were many occurrences of one attempt on the examination paper and a different attempt on the additional paper offering the examiner two different attempts with neither crossed out.

Topics that were done well included:

- simple percentages
- HCF
- speed
- ratio.

Topics which candidates found difficult included:

- standard form
- inverse proportion
- division by fraction
- manipulation of surds.

Question 1

This question provided most candidates with a good start though some had difficulty with 6.5 hours being 6 hours 30 minutes in part (b). The most common mistake in part (a) was to use 4 hours 15 minutes as 4.15 rather than 4.25.

Question 2

Part (a) was well answered by many candidates although some candidates misread the question and used the fact that £68 was 76% and worked on from there to find the original 100%. In part (b) a number of candidates did not answer the stated question, instead finding the new price as a percentage of the original price. Also, the answer of 87.5% was given fairly often. In part (c) far more candidates could deal with the lower limit than the upper limit.

Question 3

Most candidates were able to use the calculator efficiently and complete the appropriate rounding in parts (b) and (c), although there was some confusion with decimal places and not all candidates were familiar with the term 'integer'. The most common incorrect answer was -2.5776.... which came from finding the square root of 7.11 rather than the square root of $(7.11 - 2.29^2)$.

Question 4

This question was well answered with the use of 3 numbers causing little problem to candidates. Many candidates had the correct answer of 12. If they didn't have an answer of 12 it was usually 6, 4 or 3, but most candidates gained at least two marks for correctly factorising into primes 2 of the 3 numbers. Some candidates, unfortunately, left their final answer as $2^2 \times 3$ and didn't evaluate this. Some candidates listed all the factors of the 3 numbers and correctly

went on to get the right answer. The usual incorrect method was to try to find the least common multiple.

Question 5

Many candidates were successful in part (a) with not too many examples of the loss of the negative sign in the power. However, in part (b), although there was familiarity with the number of centimetres in a metre, the majority of candidates, disappointingly, divided by 100 rather than multiplying consequently giving -9 as the power of 10 in the answer.

Question 6

The combination of the question being in context and the fact that the proportionality was inverse square meant that this question was beyond the majority of the candidates. Those who did set up an appropriate equation often were unable to substitute and rearrange successfully. Candidates who were successful in part (a) were often successful in part (b) also.

Question 7

This question provided some marks for the majority of candidates as they were able to write down the limits for the bales and the trailer. Few realised the need to use the maximum limit in subsequent calculations. The most common incorrect answer was 140.5 ie using the lower bound.

Question 8

This question was well answered by the vast majority of candidates. Those who did not get the correct answer of 4 often gained a mark for a correct scaling eg 40m in 10 hours or a correct division attempt, though an answer of 40 was seen, alarmingly, often.

Question 9

This question was not answered well. Those who tried to do $\frac{3}{5} \times 4$ often gave $\frac{12}{20}$ as their answer. Others tried to add $\frac{3}{5}$ together 4 times, and they often ended up with $\frac{12}{20}$ as well.

Although quite a few obtained the correct answer of 3, the working shown was often difficult to follow.

Question 10

Most candidates were now familiar with this type of question and few had difficulty with parts (a) and (b). Quite a few saw the connection required for part (c) but poor arithmetic let them down.

Question 11

Many candidates were successful with this question though a significant minority simply divided, in turn, by 5, 3 and 2.

Question 12

Apart from a sizeable minority of candidates who simply tried to find 20% of £28 000, this question was well answered.

Question 13

There were many fruitless attempts to build up to 15 rather than complete a fraction division. Most said 13 hours as $15\frac{3}{5}$ was the first amount over 15 tonnes, but didn't even try to work out an accurate time. The method for the division was rarely done correctly.

Question 14

Part (a) was well done but the division of two numbers in standard form was a real struggle for most candidates. Many tried to change the numbers back to real numbers, then divide, but found it too hard to do. Some arrived with an answer of 0.6 or a 6, which achieved a mark, but very often the power of 10 was wrong. Some multiplied the 18 by the 3 to get 54 or 5.4 in the answer

Question 15

Many incorrectly thought that the number not having a reciprocal was 1. The fraction calculation involving pi caused some problems though it was, pleasingly, not that common to see candidates using a decimal for pi. Some totally correct answers were seen, and some correct methods were seen too with just small mistakes being made such as $7 \times 5 = 25$.

Question 16

Candidates either provided short and succinct correct solutions to this question or, more commonly, unsuccessfully tried many ways of simplifying the surds before giving up. The usual mistake was to do $2 \times \sqrt{20} = \sqrt{40}$ or $2 \times \sqrt{5} = \sqrt{10}$. Some candidates managed to change the $\sqrt{20}$ into $2\sqrt{5}$, but were unable to do anything useful with it – a pity that they couldn't show that $2 \times 2\sqrt{5} \times \sqrt{5}$ equalled 20. It is important for candidates to note that when answers are given examiners require sufficient detail in the working to show that the stated answer has been arrived at through appropriate correct manipulation.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the <http://www.aqa.org.uk/over/stat.html> page of the AQA Website.