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Principal Examiner Feedback

Summer 2016

Pearson Edexcel Level 2 Award in Number and Measure (ANM20) Paper 2A + 2B

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Introduction

Generally the standard of work on this paper was encouraging, but there were too many cases where students failed to show their working out. On these occasions an incorrect answer with no working would lead to the loss of all marks for that question.

Students need to take particular care with their numbers. Some figures written by students were either ambiguous or illegible.

In this series it was poor knowledge of times tables that was a particularly disappointing weakness. This was not just in section B, but also section A, suggesting that students were without a calculator.

In several questions students did not fully understand the correct order of operations to get to the answer. This was particularly evident in questions A9, A10, A12, A14, A18 and B2.

There was a significant difference in performance in the two sections. In section A, performance was usually confident, with a reasonable attempt at all questions. In contrast, in section B, performance was poor, with too many careless errors, and unanswered questions. Rarely has there been such a contrast.

The design of this paper was consistent with previous papers and the performance of students on this paper was consistent with that expected when the paper was set so that a pass mark of about 66% of the total mark could be considered as showing proficiency in Number and Measure at Level 2

Report on Individual Questions.

Section A

Question 1

This question was answered well. Students must clearly show their decimal points, some were very faint.

Question 2

Many students gained full marks on this question. There was the predictable incorrect answer of 70 in part (a) and evidence of some guesswork in part (b). There were many correct answers in part (c), though some students who chose to use 81 and 8 went on to add rather than multiply.

Question 3

This question was answered better than in previous series. There was the inevitable confusion over minus signs, but many correct answers.

Question 4

In part (b) the division was attempted by nearly all students. But this question was written to assess students' ability to write the answer appropriately and it differentiated well. Many students incorrectly wrote down an amount of money that was merely a long decimal copied from their calculator. Others realised that rounding to 2 decimal places was needed, but truncated rather than rounded. As a result, only a minority gained full marks.
In part (a) the only students to lose the mark were those who chose not to give the answers accurately from the calculator and those who did not have a calculator.

Question 5

The most common method seen was one of ×8÷100. Some students worked out 10% then 5% by a variety of means, but then could not see how to get to 8%. The most common failing of students was in not reading the question properly as it asked only for a percentage (8%), rather than an amount after a percentage increase or decrease. Many students therefore went on to perform an extra stage in their working, but as long as the correct answer of 240 was shown, they were not penalised on this occasion (see also Q13).

Question 6

Many students gave the correct answer. Some though divided by 4 (due to there being 4 sectors) whilst others merely estimated the answer.

Question 7

This was not always answered well, with too many processes demonstrating a lack of understanding of how to find the volume of a cuboid. Some students merely added the lengths or appeared to want to find the surface area. A further error was to halve at some stage, as if working with a triangle.

Question 8

Most students realised that a simple multiplication was necessary. Those who divided gained no marks. Some students thought that the answer was too large, and inserted a "money dot", giving the answer either as 40.080 or 400.80

Question 9

This question was well answered, with many students gaining full marks. The most common penalty was for those who wrote the answer using incorrect money notation, that is 438.3 rather than 438.30. Correct calculations leading to 406 and 132 were very common. Some students forgot to deduct the 99.70 or added it with the other figures.

Question 10

The most common error in this question was to multiply the three figures, without a division by 2. Some students chose to multiply 7 and 8 before dividing by 2, but then ignored the 5. A few students tried to find the surface area but found they did not have enough information on the diagram.

Question 11

Most students used a formal approach with these fractions with only a minority choosing to convert to decimals, even though they had a calculator. Most students gave the correct answer in a variety of forms. It was clear that some students tried to use the fraction function button on their calculator but

did not understand how to use it with mixed numbers. Equivalent answers of decimals, mixed numbers or fractions were all acceptable for the final answer.

Question 12

Many students understood that it was necessary to divide the diagram up in some way and showed this on the diagram by either dividing up the given shape into a combination of rectangles and a triangle or, equally often, by taking a triangle from a 6×8 rectangle. But methods were sometimes confused, with 6×3 combined with 8×2, showing a lack of understanding.

Question 13

A significant minority of students incorrectly applied a compound interest approach to this question, which is surprising since compound interest is not on this specification. There was some confusion in using the 3 and the 5, with working not always clear. As with Q7 there were too many staged approaches in trying to find percentages. And just like Q7 there were too many students who failed to read the question properly, resulting in the final answer given representing the total amount at the end of 3 years or even the result of subtracting the simple interest from the initial amount rather than the total amount of interest at the end of three years. This incurred a penalty for the final answer, though working was still credited.

Question 14

Predictably the two main errors were choosing to use the circle formula for area and using the diameter where the radius should have been used. Those students who chose correctly on both counts usually went on to gain at least 2 marks. There was some credit for those students who just showed evidence of recalling the correct formula or those students who worked with a radius of 3 with the intention of finding the circumference. Most students understood the need to find half at some stage, but when in the process was not always clear. Many students failed to add on the straight edge of 6 at the final stage; again, some students divided this by 2 before addition.

Question 15

As the conversion was given, students just had to decide the correct operations, but this was beyond many. It was not uncommon to find some working out $160 \times 5 \times 8$. Few students knew the correct processes needed to get to the answer.

Question 16

Students used a variety of methods in working towards the answer. Many students incorrectly assumed this was a question about factors and merely listed the factors of each number. Some credit was given to those who drew factor trees, where these led to listing prime factors, since these could then lead to the LCM, but most of those who used factor trees failed to combine their resulting factors in the correct way to get to the LCM. This session also saw many using Venn diagrams, but with little success. By far the most successful method was to simply list the multiples, an easy task given that they had calculators, which usually led to the correct answer.

Question 17

Most students realised that they had to work with the number 54, which gained some credit, but only a minority understood how to do this to form a percentage. The methods of building up or trial and

error to find the percentage were very common, but rarely attracting any marks since they were usually incomplete.

Question 18

It was encouraging to find that more students than is usually the case remembered the formula for finding the area of a circle but too many introduced a division of 2 unnecessarily. Addition rather than subtraction of the two areas was not uncommon and many students just found the area of the circle and ignored the square.

Section B

Question 1

This question was well answered.

Question 2

Performance on this question appeared weaker than is usually the case. In part (a) most students abandoned a traditional approach involving decomposition. A very common error was to write 108 with 33.53 giving 34.61 thus showing a misunderstanding of place value. Another common error was to subtract the 40 from 13.4 and then subtract the result from 33.53. In part (b) there were many examples of incorrect multiplication and misplacing of "carries". For such a straight forward multiplication problem, grid methods seemed inappropriate, yet many students chose to use them, but became confused since they were only multiplying by a single digit.

Question 3

Students who tried multiplication of 12 before a division of 7 found this harder to answer. An alternative method of dividing by 7, and then a combination of ×5 and addition of 56 to find the cost of 12 packets was poorly done.

Question 4

Most students understood they were working with 30 and 6 and gave these as a ratio, though the different units were not taken into account by all students. Some students found cancelling down quite difficult and lost the final mark as a result.

Question 5

In this question students need to understand that just identifying which is the bigger is insufficient, as this needs to be supported through evidence of working or calculation. This most students did and gained full marks, though a significant minority did not know how to find a fraction of a quantity.

Question 6

The two weaknesses shown by students in this question were linked to cancelling (simplifying) and notation. Whilst some students correctly used the notation $a : b$, some wrote fractions or $b : a$ in error. Many students who started with 16 : 24 were unable to simplify correctly.

Question 7

Most students realised that a division of 660 by 11 was necessary and went on to gain full marks. Only a minority chose to divide 660 by both 4 and by 7, the most common incorrect method.

Question 8

Most students were able to round at least two of the numbers ready for calculation and indeed many students then went on to carry out a process of calculation. This was usually 60 × 80. Some students attempted a division by 12 but 10 was more reasonable. Those who missed the instruction "estimate" and attempted an accurate calculation received no marks.

Question 9

The most common method seen was to find 10% as 60, 5% as 30 and then add. Many students gave the resulting answer as their final answer. Some added it to 600 rather than subtracting.

Question 10

Fractions questions rarely attract the most marks and this was the case here. In part (a) many students wrote their fractions as improper fractions. This was unnecessary and led subsequently to some very large numbers to process. Many different methods were seen here. Few students converted the second fractions to sixths. More common approaches resulted in a denominator of 18 and some students used a cross-multiply method resulting in $\frac{15}{18}-\frac{6}{18}$ while inefficient methods used improper fractions. Once the correct answer was shown subsequent poor simplification was not penalised.
In part (b) methods were equally confused, with many students again choosing unnecessarily to try to write their fractions as decimals. Most students who understood that simple multiplication was all that was needed gave their answer as $\frac{10}{63}$.

Question 11

Only a minority of students knew how to write one number as a percentage of another. Some students confused this by working with 420. Others got as far as writing the fraction $\frac{280}{700}$ but then did not know what to do with it. Certainly this was a weakness for many students.

Question 12

Conversion to improper ("top heavy") fractions was a necessity that many students were unable to accomplish, even when some had shown this skill in section A Q11. Of those who did convert to improper fractions, many showed errors in their multiplications. Equally there were also problems when it came to converting back to a mixed number. An error for some was to process the fractions and forget the existence of the whole numbers. That said, there were also many correct answers, which was pleasing to see at the end of the paper.

Summary

Based on their performance on this paper, students should ensure that they can:

- write money appropriately
- cancel fractions and simplify ratios
- express a number as a fraction or as a percentage of another number
- calculate percentages and volumes in a single step when using a calculator
- work out an amount of **simple** interest
- carry out arithmetic calculations without a calculator
- calculate with fractions and decimals without a calculator
- recall the correct formula for the area of a circle and for the circumference of a circle
- find the volume of a cuboid rather than its surface area

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