Examiners' Report
Principal Examiner Feedback

Summer 2019

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

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Summer 2019
Publications Code ANM20_2A_1906_ER

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Introduction

Section A is designed to be completed with the aid of a calculator, but the sight of a significant number of non-calculator methods would suggest that not all students had a calculator. The inclusion on this occasion of a question requiring a pie chart to be drawn made it clear that many students did not have the appropriate drawing equipment (eg a protractor & ruler) for completion of such questions.

There were too many attempts that resembled trial and improvement approaches, but the inclusion of any working out to support answers remains an issue for many. Students also need to be reminded about how they write their numbers. There are an increasing number of occasions when numbers are written ambiguously (eg 1s and 7s, 2s and 5s) or numbers are over-written, leaving them illegible.

There were some instances in this paper where working out was set out in such a disorganised way that it was almost impossible to identify a chosen route of solution by the student, in order to award method marks. In particular, questions 14 and 16 in Section A required several different stages or working. Also in Section A some students used a number of stages to answer Questions 12, with question 5 in Section B frequently done using partitioning methods. That said, there was an improvement this series in the way that students set out their work.

There were a few occasions where several methods were shown by a student; unless made clear by the student which is to be accepted for marking, no marks can be given.

It was encouraging to find that most students attempted nearly every question, in both sections.

Report on Individual Questions.

Section A

Question 1

There were many correct answers to this question. The most common error in either part was mis-counting the divisions whilst in part. In either part it was not uncommon to find students counting the wrong way, for example giving answers such as 3.3 or 103.7

Question 2

Most showed 150 : 350 in working to gain the first mark. Some then failed to simplify correctly. Some gave the answer the wrong way around (7 : 3)

Question 3

Part (a) was poorly answered. Rounding was the main issue, with many rounding to the nearest 10p, the nearest pound, or to one decimal place irrespective of the fact that this was money. Some rounded to 14.55 rather than 14.56, whilst many wrote their answer incorrectly as 14.50, 14.5, 14.60 or 14.6

In part (b) students need to understand that whenever calculations are required in this section, they must be worked out accurately. With a calculator this was a relatively easy question, yet some students spoilt their answer by truncating or rounding unnecessarily.

Question 4

A well answered question. Most students obtained the correct answer. The most common error was in just adding the three numbers given.

Question 5

A minority incorrectly chose to multiply rather than divide, but having chosen to divide, then most of the students went on to give the correct answer.

Question 6

A well answered question. Most students obtained the correct answer. The most common error was in just multiplying the three numbers given, or spoiling a correct multiplication method by also dividing by 2

Question 7

This was a well answered question. In part (a) some showed a lack of understanding by multiplying by 3

Part (b) was done best, with many correct answers; the only error was when student rounded or truncated their answer.

In part (c) a few added the indexed numbers, or used 10 or 27. There was some evidence that students failed to understand how to use their calculator or were using a calculator without a square root facility.

Question 8

A significant minority of students divided by 6 in an attempt to find the percentage. Otherwise many understood to multiply by 6 and divide by 100, though some spoilt this by multiplying by 0.6 instead of 0.06. Some used non-calculator partitioning methods, finding 10% and 5%, but then became unstuck because they did not realise how to get from 5% to 1%. Or having found 10%, 5% and 1%, added these three in finding 16% instead of 6%. Essentially non-calculator partitioning methods were far less successful than those who simply used a method equivalent to ×0.06

Question 9

A minority incorrectly chose to divide rather than multiply, but having chosen to multiply, then most of the students went on to give the correct answer. This was better done than question 5, but those without a calculator were unable to do the long multiplication they attempted. It was not uncommon to find students spoiling their answer by adding or subtracting the 42 to give 742 or 658 as their answer.

Question 10

The majority of students attempted this by a traditional approach, writing these as improper fractions. The weakest students tried to do this using only 2/5 and 1/4. There was no requirement to simplify fractions after processing. Of those students who changed the fractions into decimals to use a calculator, most then went on to give the correct answer.

Question 11

It was encouraging to see many correct pie charts. Some calculated the correct angles to be drawn, but then drew a completely inaccurate pie chart, suggesting they might not have had a protractor with them. Many who did not know how to calculate the angles merely guessed the approximate proportions, which usually failed to attract any credit. Most used labels on their pie chart. Accuracy in calculating the angles was an issue for some. Rather than calculating the angle in one step many worked out the scaling factor first by working out 360÷1000, but then failed to use the scaling factor correctly. Some worked them out using percentages, but regularly introduced premature rounding, such as 0.37 × 360 (=133) for Medium. Students would be better performing the calculations in one step.

Question 12

Students who could not work with percentages were unable to make much progress with this question. Sometimes, in trying to work out the percentage, the division by 100 was not done. Fewer students than in previous series attempted this question using compound interest methods, but there remained some confusion as to whether to give their interest as the final answer, or whether to add their answer back onto the 45200. Too many used a partitioning method to find the percentage by finding 10%, 1% and 3% rather than a more direct approach, usually leading to greater error. It was not uncommon to find students who used this approach finding 10%, 5% and then not knowing how to get to 3%

Question 13

Too many listed multiples rather than factors. Some tried to list all the factors of 24 and 56 as lists. The most successful attempts were those who used factor trees, gaining some credit for showing the prime factors. Some then went on to successfully state the HCF, but most using this method did not know how to use their prime factors to arrive at the answer. The most successful approaches went on from their factor tree to put the factors into a Venn diagram, using the three 2s in the intersection to give the correct answer of 8

Question 14

Although this was a long question it was usually very well done, with evidence of sound arithmetic in most cases. A minority showed evidence of transcription errors in working.

Question 15

There was the usual confusion of students over whether to use 18 or 9 in any circle formula, and of course a minority of students who tried to use the formula for working out the area of a circle, but this was less common than in previous series.

Question 16

Most students showed understanding of rectangular area by showing how to work out an appropriate area, usually 7 × 3. Most also showed understanding that in order to find the area, the shape had to be considered as at least one triangle and two rectangles (or one rectangle from which a triangle had to be removed). Many weaker students failed to divide by 2 in finding the area of their triangle, or misjudged the dimensions of the missing internal lengths (usually giving 3 again, instead of 4). Many gained a mark in part (b) for multiplying their answer in (a) by 9, irrespective of that value.

Question 17

Most gained some credit for the first step of showing 252, but could not then convert this to a percentage of 35. Some got as far as 1.35, but then left this as their answer rather than subtracting 1

Question 18

More were able to recall the correct formula for working out the volume than in previous series, but $\pi \times r \times h$ was a common misconception. The numbers here were the exact numbers for substitution, so there was less opportunity for error, though some still tried to use 6 for substitution. Without a calculator obtaining the final answer was impossible, and a small number failed to process the figures correctly on their calculator, but usually correct recall of the formula then led to the correct answer being given.

Section B

Question 1

This was a well-answered question.

Question 2

Evidence of some understanding was shown by those who added the 3 and the 4 to give 7. Division into 147 usually followed onto the correct answer. A significant minority of weaker students merely attempted to divide 147 by 3, and to divide 147 by 4

Question 3

A well answered question. Most students realised that a division by 5 was needed, and most then went on to multiply their answer by 9, arriving at the correct answer. There were many other different methods in evidence, such as finding the weight of 4 fans before adding onto 35

Question 4

When errors were made in this question, these errors were normally associated with the choice of the wrong sign, though times table errors again caused problems for some in part (a).

Question 5

In this question the common errors were related to poor arithmetical processing, but there were fewer examples of poor place value that in previous series, for this type of question.

In part (a) it was disappointing to see a significant number of students using operations incorrectly. For example, by just adding all four numbers, by just adding the first three numbers. The weakest students confused place value, for example adding 180 to 4.7 to give 22.7

In part (b) there were many different methods shown, including Napier's bones, grid methods and partitioning methods, even though this was multiplication by just a single digit. Place value was again an issue here, particularly with grid or partitioning methods, but so was poor recall of time tables. Those who ignored the decimal point during processing either forgot to put it back, or did so in the incorrect place.

Question 6

In part (a) there were many who just added across to give the incorrect answer of $\frac{6}{18}$, or even $\frac{1}{3}$. Those who tried to use a common denominator did so using either 12 or 72. This was not guaranteed to lead to the correct answer, since not infrequently an error was made in calculating the matching numerators. Any equivalent fraction to $\frac{7}{12}$ was acceptable for the final answer.

Part (b) was a well answered question.

Question 7

In answering part (a) it is important that students realise that in these types of question their final answer needs to be supported by working. Credit was sometimes given for an incorrect conclusion linked to their two answers given, as long as a correct method was shown for at least one of these two answers. Whilst many students realised that a division of 7 or 8 was needed, this was not always done accurately.

Part (b) was well answered.

Question 8

Those who knew how to work out a percentage usually gained some credit. Many found 10% then doubled to give 20%. Some just left their answer as the percentage figure (70) and some spoil their answer by subtracting from 350. Overall a question that proved to be a good discriminator and provided a good range of marks.

Question 9

Students who attempted to work this out accurately gained no marks; the question asked for an estimate, and there must therefore be evidence of estimation before any marks are awarded. Sadly there were far more instances this season of students just attempting to work it all out accurately. Those who chose appropriate numbers to use as estimates gained some credit, though this did not include those who just truncated to 0.52 to 1. Some used the rounded numbers 42 and 49; whilst credit could be given for rounding, it was not appropriate to use these numbers in calculation since a long multiplication was necessary: the purpose of estimation was to make easier calculation. A common error was in assuming division of 0.5 was performed by halving the numerator. Some calculations were again spoilt by poor arithmetic.

Question 10

Many students started by writing 520/800, but were then unable to convert this into a percentage.

Question 11

The key to this question was of course finding a common denominator. Those who merely showed $5-1$ and $2-3$ or equivalent gained no marks. But it was encouraging to see many who wrote $\frac{10}{15}-\frac{9}{15}$ or equivalent. Some decided to write their fractions as improper fractions, which could still lead to the correct answer, but then involved more work and larger numbers to deal with. Some ignored the whole numbers completely. It was disappointing to see a significant minority failing to write their answers as a mixed number as requested, which meant they lost the final mark.

Summary

Based on their performance on this paper, students are offered the following advice:

- Ensure they arrive to take the examination with all necessary equipment, which includes a calculator, a ruler and a protractor for Section A.
- Ensure that figures are written clearly and are not over-written.
- Present working legibly and in an organised way on the page, sufficient that the order of the process is clear.
- Practice basic numeracy such as addition/subtraction.
- Ensure that they have learned the times tables.
- Spend more time ensuring that they read the fine detail of the question to avoid giving answers that do not answer the question, and to give answers in the form required, such as simplified if asked for.

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