Examiners' Report
Principal Examiner Feedback

Summer 2017

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

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Introduction

The inclusion of a pie chart question on this occasion made it clear that many students did not have the appropriate equipment (eg a protractor and a ruler) for completion of such questions. Completion of some questions in section A by non-calculator methods (eg Q5, Q15) would also suggest the absence of a calculator.

There were too many instances in this paper where working was set out in such a disorganised way that it was almost impossible to identify the chosen route of solution by the candidate, in order to award method marks. This was particularly the case in Q12 and Q16 in Section A. There were also cases where several methods were shown; unless it is made clear by the candidate which is to be accepted for marking, no marks can be given. The inclusion of working to support answers remains an issue for many students; but not only does working need to be shown, it needs to be shown legibly, demonstrating the processes of calculation that are used.

Students need to be reminded about how they write their numbers. There is 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 too many attempts that resembled trial and improvement approaches.

In this series too many students appeared unprepared for the paper, evidenced by unattempted questions, by confused methods and by poor mathematical processing.

Reports on Individual Questions

Section A

Question 1

There were many correct answers to this question. The most common error was in ignoring place value for example by giving the answer in part (a) as 33 or as 25 (or 2.5) in part (b).

Question 2

There were the inevitable mixtures of signs, but usually both answers were given correctly.

Question 3

Part (a) was poorly answered. Rounding was the main issue, with many students rounding to the nearest 10p, to the nearest pound, or to one decimal place irrespective of the fact that this was money. Some students rounded to 47.23 rather than 47.22

For 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 their answer unnecessarily.

Question 4

This was another well-answered question.

Question 5

With all percentage problems the most common error is to divide (625÷6) rather than multiply. Those students who correctly multiplied usually ended up showing the number 37.5, but there was a significant minority who then went on to do more work with this number, such as adding it to 625, or even taking it away. In this question full marks were still given, as long as the 37.5 was seen, in recognition of the skill shown in terms of percentage calculations.

Question 6

This was a well answered question. In part (c) a few students multiplied the individual numbers, using 2 and/ or 3; some students added at the second stage rather than multiplying.

Question 7

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

Question 8

The majority of students attempted this question by a traditional approach, by writing the mixed numbers as improper fractions. The weakest students tried to do this using only $\frac{3}{4}$ and $\frac{4}{5}$. 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 9

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

Question 10

Students not only had to remember the formula ($\frac{1}{2}$ base × height) they had to choose the correct two measurements to use in their calculation. Of those who chose two measurements to use, many merely multiplied them together and did not divide by 2. Some of course chose the wrong pair of measurements to use. The weakest students merely multiplied all three numbers together; some then divided by 2.

Question 11

It was encouraging to see many correct pie charts.

Some students 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 students who did not know how to calculate the angles merely guessed the approximate proportions, which usually failed to attract any credit. Most students used labels on their pie chart. Accuracy in calculating the angles was an issue for some students. Rather than calculating the angle in one step many students found the scaling factor first by working out 480÷360, but then rounded this to 1.3 or even 1. Students would do better by performing the calculations in one step, or using accurate factors.

Question 12

Although this was a long question, it was usually very well done, with evidence of sound arithmetic in most cases. A minority of students showed evidence of transcription errors in working. Common errors included counting 36 hours as overtime, working with just 4 hours of overtime (ignoring the 32 hours at the normal pay rate) and mixing up the order of operations.

Question 13

There were many attempts using multiples, which gained no marks. The most successful attempts were by those students who listed factors, frequently arriving at the correct answer. Those students who used factor trees gained some credit for showing the prime factors, but most using this method did not know how to use their prime factors to arrive at the answer.

Question 14

Those students who started working with the area formula received no credit. Those students who recalled the circumference formula sometimes made an error in using 9 cm instead of 4.5 cm as the radius. Some students failed to divide the circumference by 2 for a semicircle. A significant minority failed to add on the straight edge of 9 cm, but this was only penalised by the loss of a single mark.

Question 15

Students who could not work with percentages were unable to make much progress with this question. Sometimes 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 interest back onto the £5000

Question 16

Many students started by either trying to find the area of the front face by using two rectangles, or taking the whole 5 × 9 and subtracting the square 2 × 2. Any reasonable attempt could then be followed by ×10 to pick up a further mark. Some students picked up a mark by starting with working out the volume of a cuboid but in this case they had then to make clear their complete approach to gain further credit. Weaker students multiplied together incorrect measurements or merely multiplied some of the numbers together in a random way. Credit could not be given if the working shown was unclear, disorganised or ambiguous.

Question 17

Most students gained some credit for the first step of showing 224, but could not then convert this to a percentage. Some students got as far as 135, but then left this as their answer rather than performing a subtraction of 100.

Question 18

The success rate of this question was higher than that for question 14. More students were able to recall the formula for working out the volume. The numbers here were the exact numbers for substitution, so there was less opportunity for error. Without a calculator obtaining the final answer was very difficult and a small number of students failed to process the figures correctly on their calculator, but essentially correct recall of the formula usually then led to the correct answer being given.

Section B

Question 1

This was a well answered question.

Question 2

This was a well answered question.

Question 3

Most students showed 360 : 270 in working to gain the first mark. Many students then failed to simplify correctly. Some students gave the answer the wrong way round (3 : 4).

Question 4

In this question the common errors were related to poor arithmetical processing, either by adding or subtracting incorrectly, or by poor recall of times-tables.

In part (a) it was disappointing to see a significant number of students using operations incorrectly. For example, students just added all four numbers, students just added the first three numbers, or students worked out (6.7+26.53−17.94) + (380−17.94), or similar calculations. The weakest students confused place value, for example adding 380 to 2653. When the first three numbers were added first, subtraction of the 17.94 then became an issue for some students.

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. Those students who ignored the decimal point during processing either forgot to put it back, or did so in the incorrect place.

Question 5

This question was not well answered. Credit was sometimes gained for showing the fraction $\frac{160}{400}$, but few then realised how to write this as a percentage.

Question 6

Students who attempted to work this out accurately gained no marks. Those who chose appropriate numbers to use as estimates gained some credit, though this did not include those who just truncated to 60 or to 40. 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 7

In part (a) a number of methods were seen, but where students understood the method they were using, this usually led to the correct answer.

Part (b) was well answered. In neither part did students have to simplify and correct equivalent fractions were therefore accepted for full marks.

Question 8

Evidence of some understanding was shown by those who added the 2 and the 3 to give 5. Division into 115 usually then led to a correct answer. A significant minority of weaker students merely attempted to divide 115 by 2, and to divide 115 by 3

Question 9

Those students who knew how to work out a percentage usually gained some credit. Many students found 10% and then doubled as part of this method; few students realised that 20% was just $\frac{1}{5}$. Some students just left their answer as the percentage figure (30) and some spoilt their answer by subtracting from 150.

Overall, though, a well answered question.

Question 10

It is important that students realise that in this type of question their final answer needs to be supported by working. Credit was sometimes given to students for an incorrect conclusion as long as this was correct for their two values, which must be shown. Whilst many students realised that $\frac{1}{4}$ of 140 was just a division by 4, fewer remembered a process by which $\frac{2}{3}$ of 51 could be found.

Part (b) was well answered.

Question 11

The key to this question was of course finding a common denominator. Those students who merely showed 3−1 and 5−4 or equivalent gained no marks. But it was encouraging to see many students who wrote $\frac{12}{20}-\frac{5}{20}$. Some students decided to write their mixed numbers as improper fractions, which could still lead to the correct answer, but then involved more work and larger numbers with which to deal. Some students ignored the whole numbers completely. It was disappointing to see a significant minority of students failing to simplify their final answers as requested, which meant they lost the final mark.

Summary

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

- arrive to take the examination with all necessary equipment, which includes a protractor, a ruler and a calculator
- spend more time reading 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 when asked to simplify
- present working legibly and in an organised way on the page so that the order of the process of solution is clear
- write figures clearly and not written-over
- practise basic numeracy such as addition/subtraction
- learn times-tables and other number bonds

Grade Boundaries

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