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General

The paper proved to be quite demanding even though many of the topics were well known. Small variations in a number of questions, some of which were designed to help candidates, sometimes seemed to cause problems especially for weaker candidates. However the poorest performance was again reserved for the algebra work, which despite being straight forward, for example on Questions 6 and 8(b)(i), was very poorly done. However, more able candidates were able to show their knowledge consistently across number and algebra and many excellent papers were seen.

Topics that were well done included:

- ratio
- use of a calculator
- fraction arithmetic
- simple standard form.

Topics which candidates found difficult included:

- simplifying and factorising algebra
- proportionality
- calculating with standard form
- surds.

Question 1

This provided a good start for most candidates with the well tested use of calculator followed by a test of accuracy which on this occasion was one decimal place. Though most did well, quite a large minority of candidates repeated a full set of decimals instead of one decimal place.

Question 2

This was well answered by a good proportion of candidates. However, the concept of different charges for different days defeated many. A method of 165 ÷ 45 was fairly common with the answer rounded to a whole number. 165 ÷ 15 was more common. The most frequent error was to misread “off” as “of” and end with an answer of 9l. Many candidates who used a correct approach forgot to add on the first day and offered 4 as the final answer. Some candidates tried to use 33% for a third and lost the accuracy mark. Despite this there were many completely correct answers.

Question 3

Most candidates coped very well with part (a). Quite a number chose to divide by 6 and ended with 21 and 105 as their answers. A very small number reversed the answers giving 108 adults. In part (b) many candidates lost focus on the individual values of 18 and 108 and rarely then worked with 27 and 108. Many could not resist the temptation to add them up again and others cancelled down but not to 1 : k as instructed.

Question 4

Many candidates did well on this question. Others tried to do everything conceivable with the numbers. The main problem for those who did not quickly get the correct answer was to divide by 84 rather than 60.

Question 5

This was reasonably well answered by two main methods. Most found 32% (or 30% or one third both of which were deemed valid) of the total and then found that this was close to the China value. Others worked out the percentage that each country was out of the total and were then fortunate that China was second in the list. Unfortunately, many candidates made errors in their standard form giving values that were out by a factor of 10 or 100. Once again the instruction 'You **must** show your working' was ignored by a number of candidates. Changing all the values to ordinary numbers did not constitute sufficient working if nothing was actually then done with the numbers.

Question 6

Despite there now having been several of these non-coursework Module 3 papers containing algebra work there was no apparent improvement in the standard of work produced. Cancelling was performed at random. Those who chose to multiply out the brackets failed to do so accurately. Those who did cancel out a $(x - 2)$ often then multiplied out $3(x - 2)$ incorrectly.

Question 7

The idea here is to use a multiplier and indeed many did do this. A number of candidates simply took off 36% not understanding the compound nature of the problem. There were some magnificent examples of perseverance shown by candidates in this question as they meticulously worked their way through 9 repetitions of a 4% reduction and a surprising number were successful at retaining sufficient accuracy throughout their calculations even if the work was often squashed or spilled onto spare sheets.

Question 8

Part (a) was very well answered. Some candidates were able to spot one of the two factors in part (b)(i). There were some very good answers seen in part (b)(ii) with candidates carefully showing working of how the two were equal but many were defeated by this question. Few candidates read carefully enough to notice that they needed to add the seventh square prime and also a significant number worked out 18 cubed instead of 3 lots of 6 cubed.

Question 9

These questions on proportionality are now familiar and the lack of a context in this question was expected to make for a better response. However, many seemed to have little idea what to do. Many candidates didn't take the first step of putting in the = k, but started to substitute in the numbers, and the usual mistake was to work out 3.6 ÷ 1.2 = 3. There were many answers of $x = \frac{3}{\sqrt{y}}$ or x proportional to $\frac{3}{\sqrt{y}}$. Considering the amount of help they were given in this question, it was answered very badly.

Question 10

Complete answers were rare. Finding 995 proved to be the most difficult with 950 being popular. It was unfortunate that 1050 more often came from 50 + 1000 than a genuine attempt at an upper bound. Many correctly tried to multiply a minimum by a minimum but then chose to divide by their version of a minimum as well.

Question 11

In this question part (a) was much better answered than the part (b) with many halving rather than doubling in that part.

Question 12

Many candidates who achieved the correct answer seemed to do so intuitively rather than by showing working. Those who used a scaling approach often achieved the correct answer. Unfortunately those who tried division frequently started with $\frac{30}{5}$ and gave an answer of 6 and many of those who started with $\frac{5}{30}$ also usually ended with 6 - neither approach was very often converted correctly.

Question 13

There was a better response to part (a) than has recently been the case for fraction arithmetic with few simply subtracting both numbers to give $\frac{1}{-2}$. In part (b) many did not spot the link and went through a more difficult sum for the single mark. It was not uncommon for part (b) to be worked through correctly after part (a) had been done incorrectly.

Question 14

The double negative put off many candidates and many offered answers that were squares but not cubes.

Question 15

Part (a) was designed to give candidates a starting point rather than asking for the product of prime factors of 192. Most candidates' first step was to try to multiply 8 and 24 and often not get 192. Those that did get 192 were rarely able to get beyond 2 x 96 in their products. Those who worked individually with 8 and 24 were more likely to obtain the correct answer. Most candidates were successful in part (b).

Question 16

Part (a) was very well done. Zeros were frequently cancelled at random in part (b), and the decimal point disappeared when it was convenient. Answers usually ended in 2 after a variable number of zeros following a decimal point. Candidates who used both numbers in standard form were more successful despite the difficulty of the negatives.

Question 17

Quite a few knew that $\frac{1}{40}$ was the reciprocal of 40 but few could change it to a decimal, for the second mark, often writing $\frac{1}{0.04}$.

Question 18

Attempts rested on whether or not the candidate realised that the 375 was the amount after the 25% increase. Most did not and so 10% of 375 = 37.5 was the most common starting point. A fair number actually did write 375 = 125% but could not continue and carried on as above. The minority who started correctly trying 375 ÷ 1.25 or similar had mixed fortunes. Many of those reaching 300 did so by realising that 25% of 300 is 75.

Question 19

A few candidates were able to show mathematical efficiency in part (a) by adding the simplified surds before squaring and therefore obtaining the answer very quickly. Others multiplied out the two brackets and often lost square roots, xs or both. Part (b) was done a little better with a few spotting and able to use the link with part (a).

Question 20

There were some excellent attempts at this question. The $81^{-\frac{3}{4}}$ was least well dealt with whilst there were quite a few good attempts to find the recurring fraction. Many candidates, having found both the other numbers to be worth $\frac{1}{27}$ did a long division to check the decimal. Others failed to prove in some way that $\frac{37}{999}$ cancelled to $\frac{1}{27}$.