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Introduction

Some very good work was seen from many candidates in this paper.

Many candidates were able to give good answers to a range of questions.

The standard of working out for the quality of written communication (QWC) questions, when seen, was often easy to follow and led to many candidates receiving the majority of marks available.

Overall, many candidates lost marks through:

- failing to add and subtract correctly (single, two-digit and three-digit numbers) giving answers only which were incorrect despite being close, indicating that they had used the correct method but had made errors in their number work

- poor literacy skills and, on occasion, such poor handwriting that it was impossible to decipher what was written. There were also occasions where candidates seemed to answer a different question to the one asked

- producing working out in a random manner, which makes it difficult to see if the calculations given are valid for that part of the question.

Reports on individual questions

Question 1

The vast majority seemed to answer part (a) easily. Again, part (b) was well answered.

The vast majority also seemed to answer part (c) easily. However, the standard of candidates' responses was variable. Many struggled to draw a quarter-circle and this was usually why they lost marks. Common errors were half-circles, squares and sectors more like a third or fifth of a circle.

Question 2

A noticeable number of candidates did not attempt part (a). Various combinations of incorrect lines were chosen, including lines that met on the diagram.

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Candidates need to be reminded that they cannot lose marks for incorrect answers and so should have tried something. It might help to remind candidates to turn the paper round, as they may find it easier to see parallel lines that are horizontal or vertical.

Part (b) was more successful with very few candidates failing to get the mark.

Part (c) was generally well answered with spellings such as 'accute' still gaining the mark. However 'cute' was not accepted. The most common errors were 'obtuse', 'right angle' and 'reflex'. There were also a number of candidates who misunderstood the question and measured the angle instead.

Part (d) was not so well answered with some candidates giving inaccurate readings of values around 130° or reading in the wrong direction and giving an answer of around 60°.

Question 3

Almost all the candidates gave fully correct answers for part (a).

Part (b) was well answered, with only a small number of candidates not able to order the negative numbers.

There was a majority of correct answers for part (c). However, some candidates showed a lack of understanding of fractions, decimals and percentages and few candidates showing any working out.

Question 4

Part (a) was accessible to all with most candidates scoring the mark. Part (b) was also accessible to most with the majority scoring the mark.

In part (c)(i), most candidates were able to list the outcomes correctly and gained the two marks here with very few mistakes. The most common error was to go past 6 as a score on the dice or to use three different letters as well as numbers.

For part (c)(ii), many candidates failed to see the link with their combinations and gave the answer as a half, or equivalent. One or two attempted to calculate the answer using other methods such as a tree diagram. An answer of $\frac{3}{6}$ was a common response, as was $\frac{3}{11}$, when the candidate did not include the given combination.

Only occasionally was the answer given as a ratio or in words.

Question 5

A huge variety of approaches were seen here. The most successful candidates set out their work in a logical way, with a few words of explanation at each stage, rather than relying totally on the calculations to explain their thought process.

The first method on the mark scheme was the most popular. However, where the 'knocking off coins' method was seen, it was generally successful. Candidates who failed to realise that the price for the apples needed halving ran into problems, often stating that Sarah would not have enough money to buy both items. They should realise that if the question asks how much change will be left, then a positive/possible value is expected.

This was a QWC question that clearly asked for all working to be shown. Candidates who did not show any working for the total of the fruit and simply wrote £1.50 lost marks, as it was possible for them to have got the answer by simply adding the given two values, 30p and £1.20. Encouragingly, even where £0.20p or 0.20p was seen in the working, most candidates were able to express their answers using correct money notation.

Question 6

Part (a) was accessible to all. Most candidates scored two marks. Those who scored one mark usually lost the other mark because they only drew two lines or through very inaccurate drawings. A ruler would have helped produce straight lines.

Part (b) was well answered. The most popular incorrect answer was 4.

In part (c), it was evident that many Foundation candidates continue to confuse area and perimeter, and many answers of 34 were offered. Some candidates calculated 70 and then doubled, some combining concepts of both area and perimeter.

7 × 10 on its own was awarded a method mark.

Question 7

Part (a) was accessible for almost all candidates. The majority answered part (b) correctly and part (c) was also very well answered.

Part (d) showed a wide variety of answers. The most common misconception was that the range was calculated by finding the difference between the largest and smallest frequencies, ie 5 − 2 = 3. Another error was taking the same two frequency columns and finding the difference between the two marks, ie 13 − 12 = 1. Another error was to take the total number of students and divide by 5 to obtain the answer 3.4. On occasions, candidates thought that the range and the median were the same and wrote the full list of marks in order, starting with the smallest, and crossed them off from each end to obtain a range of 13.

In part (e), some candidates thought that the total number of students was found either by 10 + 11 + 12 + 13 + 14 = 60 or the previous calculation, and dividing the 60 by 5 to get the answer 12. Many added the vertical axis values as opposed to the bar heights getting 1 + 2 + 3 + 4 + 5 = 15. Of those who tried the correct method, too many could not add the five single-digit numbers correctly and an incorrect answer of 18 was commonly seen.

Question 8

Part (a) was well answered.

Part (b) was generally poorly answered. Many candidates did not seem to be able to deal with the concept of time correctly.

A disappointing number of candidates chose to do 7 − 3 minutes and 45 − 28 minutes, thus just taking the smallest value from the largest in each time unit. Additionally, a large number of candidates completed this task assuming that time is a decimal unit. They tried to half or double the times given but too often arrived at 6.90 or 3.64. The use of time units was also a challenge for most candidates.

Question 9

Part (a) was quite successfully answered and, although some candidates gave a4 rather than 4a, this was not penalised. The most common error was to write 4^{a} or a^4.

Parts (b), (c) and (d) were also well attempted with most realising what was expected.

Part (e) was not well done on the whole. Most candidates showed no working; those who did mainly chose not to solve the question using a traditional algebraic technique. Very little use of the flowchart method was seen, but it was successful where used. It was common to see 5 given as an incorrect answer, especially following an embedded approach.

Question 10

In part (a), many candidates were able to give one of the two acceptable answers. The most popular incorrect answer was rhombus.

Part (b) was slightly better answered than part (a). However, spelling was a challenge.

Many predictable misconceptions were seen in part (c). Again there was confusion between area and perimeter. Also, some candidates used the sloped edge instead of the vertical height multiplied by 3. Other candidates gave the area as 8, indicating the rectangle around the parallelogram.

Far too many candidates showed no working out. Also careless errors such as $2 \times 3 = 5$ were seen.

Question 11

Part (a) was well answered. Most candidates were able successfully to write down the coordinates of *G* and many also found the coordinates of *H* correctly.

In part (b), candidates who had drawn a line between the two points were generally more successful at finding the midpoint. Many gained part marks by either indicating on the diagram or by writing one correct coordinate. The most common answers that scored no marks were (1,0) where candidates had not made any mark on the diagram.

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Candidates should be reminded of the beneficial aspect of drawing on the diagram.

Question 12

Part (a) was well answered, with the majority of candidates scoring both marks.

Many candidates scored some marks on part (b). However, fully correct answers were less common in this part of the question.

In part (c), candidates who chose to show working out scored well, although a good proportion thought there are 380° in a quadrilateral. All too often candidates lost all marks, although their answers were close, because there was no working out to mark.

Question 13

In part (a), the majority of students managed the substitution and gained both marks. However, a common error was to multiply the 16 by 5, leading to an answer of 80.

More seemed to struggle with part (b) with many errors in number work. Common errors were 40 − 12 = 38 or 28 divided by 4 equalling 6 or 8.

Where the common error in part (a) was seen (giving an answer of 80), this usually resulted in an incorrect answer of 2.5 hours in part (b).

Question 14

On the whole, part (a) was successfully answered.

In part (b), a variety of approaches was seen: some were very succinct and easy to follow, others were a mass of numbers and exchange rates.

A variety of exchanges was used and it was clear that candidates were confident in using conversion graphs to convert one value, but not as a tool in a multi-stage problem. The scaling of the exchange rate often led to further inaccuracies.

The other major issue was that a large number of candidates seemed to be confused about which currency they were using and converted in the wrong direction.

Question 15

This question was well attempted by all, with most gaining at least part marks.

A large majority of candidates managed to identify three numbers that totalled 20, although some failed to realise that these had to come from the given list. A few misunderstood the question and instead found three pairs. However, even if the pairs they had selected contained no more than one incorrect prime, they were still awarded the first method mark.

Additionally a lot of candidates were able to correctly identify two primes as part of their answer, but a large number thought that '1' is a prime number, suggesting that this topic needs further reinforcement.

A number of candidates correctly identified three primes that did not total 20. For those who correctly identified three primes that did total 20, 2, 7, 11 was the most popular choice.

ResultsPlus
examiner tip

Candidates should be encouraged to reread the question to ensure that their solution satisfies all criteria.

Question 16

In this question, simply listing multiples of 9 and 12 would have gained two marks, but unfortunately candidates made simple arithmetic errors.

When candidates tried to list the times, they again made careless errors or struggled to deal with changing the hour. A few pictures of clocks were drawn.

A good proportion of correct answers were seen.

Question 17

This was well answered, although some candidates drew elaborate diagrams. A tally chart was all that was required. Some candidates just drew two columns and so scored part marks.

Question 18

This question wasn't answered as well as expected, bearing in mind that this type of question has been in the last few exam series. Finding $70°$ seemed to be quite easy; most candidates who found $70°$ knew which angle it applied to, but following it with a complete method to find x was rare.

Candidates are getting better at using the correct terminology, as the reasoning for angles in a triangle and angles on a straight line was often correct. However, candidates are still struggling to gain the communication by not giving **complete** explanations of their reasoning. Parallel lines were often mentioned despite not being present.

ResultsPlus
examiner tip

Candidates should be given regular access to mathematical notation.

Question 19

As expected, a wide variety of methods was employed for this question, some to great effect, others less so. The decimal point caused a problem for many candidates trying to employ a grid method, often ending up with 1, 80, 3 × 40, 7. Those who chose to ignore the decimal point and reinsert it at the end were significantly more successful. The grid methods proved popular and were carried out by many reasonably well. Candidates who used repeated addition often either incurred too many errors or seemingly lost sight of what they were doing, and so scored nothing. With the 'traditional' method, a number of errors came from answers in the wrong columns or confusion over which number to put down/carry forward. Most candidates remembered to 'leave a gap' or 'add the zero'.

The candidates who made no more than one multiplication error were largely successful at placing the decimal point and thus many scored two of the available marks. The most common multiplication error was 7 × 8.

Some candidates treated this as an estimation question. Whilst an estimation might aid candidates to see if the answer achieved was sensible, it was not an estimation question.

Question 20

Part (a) was relatively well answered with many candidates being able to give at least one correct answer. However, some candidates repeated the same reason twice, just using different words to mean the same thing. Only one mark was awarded.

Part (b) was less well answered. Too many candidates continued to discuss the questions rather than the concept of bias. Few candidates seemed to be comfortable with the concept of bias.

Question 21

A fully correct answer was rare for this question a most Foundation candidates struggled to use all three pieces of information. Few candidates managed to get the two relatively simple marks for both the line 3 cm from *DC* and the arc 5 cm from *C*, as many chose to draw only one. A few candidates lost marks for not extending the line/arc far enough.

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Candidates should be encouraged to draw loci as long as possible in the given region.

It was rare to see a good attempt at the angle bisector; a few candidates believed they could just join *A* and *C*. For those who did draw the bisector, construction lines were not necessary for the mark. Common incorrect answers included random patches shaded in or small pictures of trees.

Question 22

This was a multi-stage problem but using relatively easy mathematics. Very few candidates did formal percentage calculations, with most stating '10% is...'.

Candidates who were able to follow the question through were often successful.

Most candidates used the method of 6 × 200 and 4 × 350 first and then worked out the percentages and a number got to £200 and did not add this to £530.

Occasionally candidates worked out 10% and 5% of £530. Others mixed up the calculations for the car and home insurance. Too many added 1200 and 1400, and gave an answer of £2600.

Question 23

As the last question on a Foundation paper, this was still accessible to a lot of candidates.

Many managed to get started and work out 32 girls and 48 students. Some stopped at that point, gaining only two of the marks. Others then multiplied by 4, forgetting about the first school. However, many were able to carry on to successfully find 240 students. Those who tried the ratio method often came unstuck after stating three parts, commonly continuing to then divide 16 by 3. All too frequently, answers that gained no marks included those where candidates had interpreted the ratio the wrong way and proceeded to halve 16 as well as those who simply did 16 × 5.

Summary

In summary, based on their performance on this paper, candidates should be advised to:

- Show full working out. More evidence of working out should be offered to allow part marks to be awarded.
- Check arithmetic working for careless mistakes.
- Clearly answer the question asked.
- Produce working out in an ordered manner.
- Use short, clear sentences to answer descriptive questions.

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