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Principal Examiner Feedback

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GCSE Mathematics (1380)
Paper 2F

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1. PRINCIPAL EXAMINER'S REPORT – FOUNDATION PAPER 2

1.1. GENERAL COMMENTS

1.1.1. There were many good responses. Candidates were particularly good at finding averages and criticising and improving questionnaires.

1.1.2. Simple algebra was also carried out well.

1.1.3. Not enough candidates can calculate with percentages. Too many fell back on 'build-up' methods or were unaware of how to find simple percentages.

1.2. REPORT ON INDIVIDUAL QUESTIONS

1.2.1. Question 1

In part (i) answers were generally accurate with few errors.

Although many candidates got the correct reading in part (ii), there were common errors of the sort 22, 20.4 and 22.2 and 36 from reading the scale in the wrong direction.

1.2.2. Question 2

This was a simple question designed to assess straightforward calculations of time.

In part (a) many candidates got the correct answer (7:15pm or 1915). Full marks were also given for alternative non-standard forms where the context made it clear (7.15). Often, candidates did the calculation in their head. Those that did show any work generally used a build up method along the lines of 17:55 18:00 19:00 and 19:15 or more rarely, 17:55 18:55 19:00 and 19:15. Of course, having a calculator did lead some astray and produced answers such as 18:75 (17.55 + 1.20) and 18:35 (17.55 +80).

Part (b) was also quite well done. Candidates could use the direct method of counting on from 17 55 to 18 34 or were allowed to work back from the answer to part (a). Some candidates misunderstood and worked out the time until the programme finished (41 minutes).

1.2.3. Question 3

Candidates did well in part (a) although occasionally the 7.01 and the 13.1 were round the wrong way.

Part (b) was answered correctly by nearly all candidates.

In part (c) the brackets proved to be a challenge. (15 – 4) was seen as often as the correct (2 + 1). Many candidates had more than one set of brackets and these were often unmatched.

1.2.4. Question 4

Many candidates were able to write down the correct answers for part (a), although a significant minority wrote down the coordinates reversed.

For part (b), many plotted where they thought the midpoint was and tried to read off the coordinates and others had an intuitive idea of what to do often getting the x-coordinate correct but not the y-coordinate, which was often given as 1 instead of the correct 0.5.

1.2.5. Question 5

Many candidates were able to score 1 or 2 marks for answers to the first two parts.

Since the pie chart was drawn accurately it was possible to get a mark for the angle of the sector by giving an answer in the range 103^o to 107^o. However, most candidates calculated their value. The entry for chocolate proved more of a challenge as candidates had to reason proportionally presumably from the entry in the top row by finding one third of 12 and adding on to get 16. This was rarely seen and the answer of 18 was much more common.

1.2.6. Question 6

There was less evidence of confusion between the area and perimeter concepts on this question than has been seen on some past examination papers. This may be due to the fact that the area was much easier to count than the perimeter. Units were generally correct or omitted or occasionally represented just by the power, so 28^2 was not uncommon. There was the occasional cm^3. Some candidates thought they had to calculate the area rather than count squares.

1.2.7. Question 7

Parts (a) and (b) were well answered. Candidates certainly had been trained to measure lengths and angles.

Part (c) was also well done. Most candidates recognised that the angle had to be obtuse and drew it accordingly although there were some who gave the 50^o supplementary angle.

1.2.8. Question 8

This was well answered. Most candidates knew what went in the tally column and were then able to summarise that in the frequency column, usually with correct results. Very occasionally, frequencies were put in the tally column with the frequency column left blank or filled with other numbers such as the rankings of the frequencies.

The bar chart was completed well in part (b).

1.2.9. Question 9

Generally the correct fraction was seen in part (a), although a few candidates wrote $\frac{5}{7}$

Part (b) was generally well done, although 0.38 and 3.8 were common errors.

Part (c) was a question which required some independent thought from the candidate. The standard strategies are to convert the fractions to equivalent vulgar fractions with the same denominator or to convert each of the fractions to decimals or percentages. Many candidates did do this and wrote down the correct answer of $\frac{7}{24}$. Some candidates wrote down this answer without showing any working. They did not score any marks. Other candidates decided to convert the fractions to fourths which meant their fractions had decimal numerators. This was allowed if carried out accurately and the correct conclusion drawn. Other candidates made all the numerators unity in which case the denominators were decimals or divided the denominator into the numerator. These approaches are mathematically incorrect since $\left|\frac{a}{b}-\frac{1}{4}\right|=\left|\frac{4a-b}{4b}\right|$; $\left|\frac{b}{a}-4\right|=\left|\frac{b-4a}{a}\right|$ so the difference depends on the size of *a* and *b*, or more simply note that 3, 4 and 5 are equally spaced but $\frac{1}{3},\frac{1}{4},\frac{1}{5}$ are not.

Some candidates drew diagrams to show the fractions - presumably taking the idea from part (a). However, these were not successful as the diagrams did not show a clear enough comparison.

1.2.10. Question 10

There were a variety of responses to part (a) apart from the correct one. A very common response was p^6 followed in order of frequency by $p + 6$ and $6p$s.

In part (b), as well as the correct answer, a very common response was 5.

1.2.11. Question 11

In part (a) the table was generally filled well.

Generally points were plotted correctly in part (b) but a substantial number of candidates did not join the points, including those who plotted all the points correctly in a straight line.

In part (c) there were a pleasing number of candidates who scored full marks. Some used the conversion graph they had drawn whilst many others used a correct calculation.

1.2.12. Question 12

Answer to part (a) were very good, with many candidates ordering their list.

In part (b) there were several misconceptions regarding the range – confusion with one of the other statistics being one of the major issues. Some candidates left the answer as 90 – 99

There were several misconceptions regarding the mean in part (c) with confusion with one of the other statistics being one of the major issues. Some candidates had the correct idea of adding the values and dividing by 10 but sadly forgot about Bodmas ending up with an answer over 800.

1.2.13. Question 13

In part (a) answers were generally good showing that candidates understood the arithmetical equivalence of the equation.

Part (b) was not so good, because of the confusion what to do with the 9 and the 3. Although many candidates did get the correct answer of 27, there were also many who got the answer 3.

1.2.14. Question 14

Most candidates managed to get at least 1 mark in the three parts of the question.

The number of faces in part (ii) was the part best answered.

There was evidence over confusion between the terms 'edge' 'vertex' and 'face' so that often the right numbers were in the wrong place.

1.2.15. Question 15

Many candidates made a good attempt at this question. They first of all worked out 3×1.24 and then subtracted their answer from the total cost of £5.08 to find the cost of the 2 kg of carrots. Candidates then had to divide by 2 to get the cost of 1 kg. Typical errors were those of omission – the $\times 3$ when finding the total cost of the potatoes and the $\div 2$ when finding the cost of a kg of carrots. Generally such mistakes lead to the loss of 2 of the 3 marks.

1.2.16. Question 16

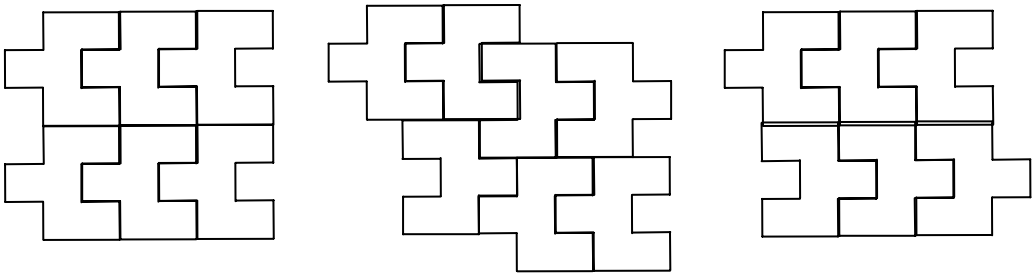
This was very well answered. If there were errors, they tended to come in the final 2 columns where candidates did not notice that their entries did not add up to the given totals.

1.2.17. Question 17

Successful candidates worked out the sum of the 3 given angles in the quadrilateral to get 288°. They then subtracted this from 360° to get the size of the missing angle (72°). The last stage required the subtraction of 72° from 180°. Candidates fell at all points with candidates getting to the 288° and stopping, or getting to the 72° and stopping. Some candidates thought that the quadrilateral had two equal angles of 62 and ended with an answer of 118° whilst others simply subtracted the 62° from 180° presumably from a misuse of angles on a straight line.

1.2.18. Question 18

This shape can tessellate in some interesting different ways. The main responses that gained full marks were:



But there were others.

Many candidates did not appreciate that a tessellation requires a repeat of the given shape without any gaps.

1.2.19. Question 19

The typical error was to ignore Bodmas, therefore ending with an answer of −1.56. Some candidates used a calculator which was in fixed format so the answer was necessarily inaccurate.

Candidates had difficulty with the last part. There were a variety of incorrect responses – failure to round up the 4 to a 5 or to multiplying the answer to (a) by 10 or 100.

1.2.20. Question 20

Simple interest was not well known to candidates. There was little sign of the formula based expression $\frac{3500\times 2.5\times 3}{100}$. Some candidates did work out 2.5% of £3500 correctly but then did not multiply this by 3. Others did the correct calculation but added on the interest and gave the final amount. Many candidates could not work out 2.5% of 3500 and often worked out 2.5×3500. Some candidates decided to compound the interest. There were some signs of the 10%, 5% and 2.5% but often these were carried out incorrectly.

1.2.21. Question 21

In part (a)(i) most candidates knew what a factor was and were able to write down at least 4 factors. Fully successful candidates could list all 8 factors or give 4 factor pairs. Some tried a factor tree, but were unable to use it to give a complete list.

There was a pleasing number of correct answers in part (a)(ii). In many cases wrong answers were actually common factors, just not the highest one.

In part (b) many candidates were able to make a start by listing successive multiples of 4, 5 and 6 respectively. In order to get to the lowest common multiple there have to be 15 multiples of 4, so many candidates failed to write their lists as far as 60. Appearances of 120 found from 4 × 5 × 6 were relatively rare, but the answer '1' was all too frequently seen.

1.2.22. Question 22

This proved to be a challenging question. Many candidates were able to derive the given result $y = 3x + 40$ by adding $2x - 10$ to $x + 50$, although there was no evidence that they were aware of the exterior angle property of a triangle.

In part (b)(i) many candidates took the short cut of 180 – 145 without justification although many were able to solve the equation $3x + 40 = 180$ using a small amount of algebraic manipulation.

In (b)(ii) many candidates did substitute their value found in (b)(i) to work out two of the angles in the triangle and the other one was found from 180 – 145. Few were able to carry out the full calculation and select the largest angle.

1.2.23. Question 23

There were two approaches to the simplification. One was to use the calculator and work out the value of the three powers either by writing out in full or by using the power key. Those candidates generally, if successful, produced an answer of 216 but were unable to express this as a power of 6. The other was to work directly with the powers of 6. Many candidates who tried this route misused the index laws writing 6^{10} as the numerator for example.

1.2.24. Question 24

Many candidates were reasonably successful in part (a). Most wrote down integers for example, although there was confusion about the correct end points of the list of numbers, so -1, 0, 1, 2, 3, 4 and 5 was a common wrong answer.

In part (b) candidates either knew how to apply this rule or did not. It is a topic which is tagged on to the end of the algebra specification and has little or no applications on F tier. A few candidates were able to produce something that was a proper 4 term binomial expansion and even fewer were able to simplify by collecting terms to a correct 3 term expansion.

1.2.25. Question 25

In part (a) many candidates could not calculate 12% of £140. The use of multipliers was very rare. Many candidates who did calculate 12% of £140 forgot to add their answer on to £140. Candidates who tried a build up method such as 10% = 14 and 1% = 1.4 were occasionally successful, but often had problems with place value when adding the decimals to the whole numbers.

Part (b)(i) was far better answered than (b)(ii). Many candidates thought that the correct answers were 10 kg (or 10.0) and 11 kg (but not 12 kg) respectively. Part (b)(ii) was rarely answered correctly, although there were a few 11.5s seen. A significant number of candidates thought that 11.4 was the maximum possible.

1.2.26. Question 26

This was a complex problem involving ratio and fractions. Many candidates who had some idea of sharing in a given ratio were disconcerted by the fact that the divisor was larger than the sum of money to be divided. Nevertheless many candidates were able to find two thirds of £9.60 or the equivalent.

1.2.27. Question 27

This was a standard question of its type. Many candidates were able to identify (the several) errors in the question and response boxes and also to make a good attempt at an improved question. Most candidates were able to state that the response boxes overlap or that there was a box missing for 'I don't listen to music'. However, a substantial number gave answers such as ' It's not accurate' or ' 'The question is too vague.' These answers do not earn any marks.

1.2.28. Question 28

This was a multistep question involving Pythagoras and area of a triangle. There were many candidates who did not know the use of Pythagoras or used it wrongly. Errors that occurred frequently included adding the squares ($12^2 + 6^2$), failing to find the square root (108) or forgetting to work out the area of the triangle after finding the square root or just using base × height when attempting to find the area of the triangle.

1.2.29. Question 29

This fascinating question produced some interesting responses. A good minority of candidates were able to visualise a possible placement of the disks as just touching and to calculate the total number (32) from 8 × 4. However, some found the 8 and the 4 and then added. Other sensible strategies included dividing the total area by 64 and dividing the total area by the area of 1 disc. The optimal answer of 36 was very rarely seen.

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