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Examiners' Report June 2009

GCSE

GCSE Mathematics (1380)

Foundation Non-Calculator Paper (1F)

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1. PRINCIPAL EXAMINER'S REPORT – FOUNDATION PAPER 1

1.1. GENERAL COMMENTS

1.1.1. This paper was of a similar standard to that of last year. At the lower level it was perhaps slightly more demanding.

1.1.2. Most questions on this paper were accessible to the vast majority of the candidature. Only in question 18 was it clear that candidates, in general, did not understand what was required.

1.1.3. The use of a protractor, question 16, was very poor and should be an issue for centres. It is pleasing to note the success in long multiplication, question 17. However not having a context in this question most certainly contributed towards its success.

1.1.4. Candidates were often let down by poor use of English in explanations. Trial and Improvement methods were used to solve many questions, often leading to much more work than necessary.

1.2. REPORT ON INDIVIDUAL QUESTIONS

1.2.1. Question 1

All parts of this question was answered well with the vast majority of candidates scoring full marks.

1.2.2. Question 2

Most candidates were able to score full marks on this question, many without showing any working. Failure to achieve full marks was usually a result of arithmetic error.

16 + 9 = 24 and 30 − 25 = 15 and also 30 – 25 = 4 were common errors. Some candidates failed to subtract, giving their sum of A and B as the answer and some gave the answer 3.2 from actually measuring part C of the diagram.

1.2.3. Question 3

Candidates clearly understood that 50% is equal to one half and were able to correctly find a half of £60 in part (a). In part (b), whilst knowing that 25% is equal to one quarter, there were a significant number of arithmetic mistakes in dividing 20 by 4; an answer of 4 was a common error.

1.2.4. Question 4

All but a few candidates were able to demonstrate their ability to draw a 7 cm line accurately. However this was often not drawn from the given point. Candidates did not lose the mark for this provided their intended 7 cm line was unambiguous. Following their success in part (a), the vast majority were then able to place the point *Q*, 3 cm from *P*, again not always following the directions of the question and often merely placing a letter *Q* on their line.

Those whose measurements were incorrect were often 1 cm short, indicating they had started from 1 instead of 0 on their ruler. There was still some evidence of candidates not having a ruler.

1.2.5. Question 5

The identification of subsequent terms in this sequence was usually correctly done. Some candidates wrote the next term (116) on the dotted line of the sequence and gave an answer of 114 in part (a). This was not penalised and the mark was awarded. Whilst in part (b) the correct answer of 112 was usually given, a few candidates found the seventh subsequent term (104) in error.

In part (c), the majority of candidates were awarded the mark for responses of "because they are all even" or "because 9 is an odd number". Many candidates felt that it was sufficient just to say something like "because the numbers go down in 2's". This gained no credit.

Several candidates used the word 'uneven' to describe odd and 'equal' to describe even.

1.2.6. Question 6

In parts (a) and (b), many candidates were confused in distinguishing between perimeter and area. Many gave 12 as their answer to part (a). In part (b), the omission of units was common, even when the area was correct. In part (c), many candidates successfully found the correct volume by working out 5×3 or more usually by simply counting the cubes. The most common errors seen were either calculations of 3×3×3 (=27) or mistakes in counting methods leading to answers of 13 and 14, which gained 1 mark, and sometimes 12 which gained no credit.

1.2.7. Question 7

Most candidates correctly identified the time of arrival of the 07 30 train to Alton. However the calculation of time differences required in part (b) was less than satisfactory; many candidates making simple arithmetical mistakes. In part (c), many candidates correctly identified the appropriate train but gave the time of arrival at Hexham (10 45) instead of the time from Crook (10 15).

1.2.8. Question 8

Part (a) was, in the main, answered correctly; however in part (b), 4000 and 4120 were common errors.

1.2.9. Question 9

Only one in three candidates was able to give the correct number of vertices of the cube; 6 and 12 being the most common mistakes. Part (b) was very well answered.

1.2.10. Question 10

Only a very few candidates failed to answer part (a) correctly.

In parts (b) and (c), whilst about 60% of candidates gained full marks, many errors were made. The most common incorrect pairs of answers were, (b) 3.3, (c) 3.2 (or 4.2) gaining no marks and either (b) 3.5, (c) 3.5 or (b) 3.6, (c) 4.4 which each gained 1 mark.

A number of candidates failed to write a decimal point in their answers. It was never clear if this was a simple omission or whether it was a result of confusion with the scale.

1.2.11. Question 11

Most candidates were able to correctly write down the coordinates of points *P* and *Q*, ×although a significant number reversed the coordinates to give (6, 4) and (3, 0) respectively. A significant number gave (1, 3) instead of (0, 3).

In part (c), the *x*-coordinate (2) was usually correct, but a *y*-coordinate of 4 or 5 was common. Some candidates reversed the coordinates to give (4.5, 2). This gained 1 mark only.

1.2.12. Question 12

Most candidates were able to identify the lowest temperature as –4^{o}C in part (a). Arithmetical errors prevented about 20% of the candidature gaining credit in part (b).

In part (c), very few candidates demonstrated any method; consequently many errors were made in finding the middle number. Had more candidates drawn and used number lines, many more would have been successful.

1.2.13. Question 13

Whilst parts (b) and (c) were usually correct, in part (a) many candidates gave “unlikely” as their answer. Perhaps some candidates were unaware of the meaning of an ‘ordinary’ dice.

1.2.14. Question 14

Answers to part (a) were usually correct. In part (b), many ignored the order of operations (BODMAS) and simply worked from left to right to give an incorrect answer of 60. In part (c), many candidates were unable to correctly compute 7 × 7; answers of 42 and 56 were common.

1.2.15. Question 15

In part (a), the majority of candidates gained the mark, although answers of 12x and 4 were often seen. 3y was the most common incorrect answer seen in part (b) and only about one half of the candidature gave a correct answer of y^3.

Only 40% of candidates gained full marks in part (c) of this question; the most common error being either to add the two terms in x to give 6x or to write −8y instead of +8y. Some candidates, in their working, wrote 2x + 8y and then gave an answer of 10xy or similar. Even though the correct answer has been seen, in these cases just 1 of the 2 marks is awarded.

1.2.16. Question 16

Accurate use of a protractor was seen to be poor with very many candidates unable to draw angles of 60 and 30 degrees.

A correct angle at A was often followed by candidates just joining B to the point given by the protractor, giving an incorrect value of 70° for C In part (b), many gained a mark from either knowing that 90° was the required angle or by accurately measuring their angle at C.

1.2.17. Question 17

This long multiplication question was pleasingly well done with very many candidates gaining some marks; often 2 or 3. Those candidates using 'traditional' long multiplication methods were usually successful although simple arithmetic error or place value error was not uncommon. Many candidates chose a 'multiplication table' method, often getting just one cell incorrect, for example 20 × 30 = 60 or 6000 or 500. The 'Napier bones' method was also seen and was often successful when the structure of the table was correct.

A common incorrect answer seen, gaining no marks, was 624 (20 × 30 + 6 × 4).

There were significantly fewer candidates attempting repeated addition this year.

1.2.18. Question 18

This question was very poorly answered, with many candidates realising that the lines were not parallel but unable to give acceptable explanations as to the reason. “Because the two angles are not the same” was the modal incorrect explanation given. Only a very few candidates carried out any calculation to justify their conclusion.

1.2.19. Question 19

Whilst the correct answer of 56 was the most common response in finding the size of the angle in part (a), an alarming number of candidates made errors in their calculation of 180 − 124; 46 and 66 being seen many times. Many candidates were able to give a satisfactory reason for their answer in part (ii) but still many were just repeating their working that gave them their answer in (i), or simply saying that the sum of the angles is 180^{o} without explaining why.

In part (b), about two thirds of the candidature gave the correct answer. For many, poor arithmetic in subtracting 68 from 90 was responsible for the loss of the mark.

1.2.20. Question 20

In many cases in part (a), candidates gave a fraction of $\frac{90}{600}$ and then either failed to simplify it correctly or failed to complete the simplifying process.

Part (b) was quite poorly answered, many candidates misunderstanding the demand of the question and trying to find 180% of 600. Many tried partitioning methods and often statements like “10% = 60” were seen but solutions were unable to progress and no marks could be awarded.

In part (c), the most popular misconception was to divide 330 by 2 (instead of 3) and then to divide their answer by 2 again; 82.5 or similar being a common incorrect answer seen. Some candidates failed to take account of both the yellow and red counters already having been used, omitting usually just one of them, leading to an answer of 140 or 170. One mark was awarded in these cases.

1.2.21. Question 21

The two-way table in part (a) was usually completed accurately, although a number of arithmetic errors were in evidence. In the table, the car column caused the most problems for candidates.

In part (b), the correct answer of $\frac{37}{100}$ (or 0.37 or 37%) was the most common response. Answers of 37 and 1/37 were also seen. There were also several who did not realise a numerical answer was required, responding with “unlikely”

In part (c), most candidates scored at least one mark for using either 46 or 24 in their working. Many failed to score full marks with answers of 1/46 and 24/100 being common errors. Some failed to see "not", giving an answer of 22/46. Following the correct answer in (b), many candidates gave $\frac{63}{100}$ as their answer in (c), having not fully read the question correctly.

There were less candidates giving unacceptable notation but ratio and 'out of' were still seen on several occasions.

1.2.22. Question 22

Many candidates gained at least one mark in this question for quoting either 2*c* or 4*r* or their equivalences. However $c^2 + r^4$ and 6*cr* were common mistakes.

$2c = c^2$ showing a basic misconception was also seen.

1.2.23. Question 23

Many candidates were able to gain full marks in this question; however many did not as a result, once again, of poor arithmetic. Errors were made in summing the three given angles but the majority of mistakes were for inaccurate subtraction of 318 from 360; 52, 58 and 62 being seen often.

The greater concern in this question is the vast number of candidates thinking that 380^o is the sum of the angles of a quadrilateral.

1.2.24. Question 24

Very many candidates employed trial and improvement methods in their attempt to solve these two linear equations. In part (a), this lead to many embedding the answer of 2 in their working and giving an answer of '9' on the answer line. This often gained one mark.

In part (b) such methods were less successful with the answer being a fraction. Incorrect answers of 6 or 7 or 6r1 were commonplace.

Many candidates are clearly unaware of the meaning of 2*x* and 2*y*, using them as 2+*x* and 2+*y* respectively, giving answer of (a) 4 and (b) 11. (a) 8 , (b) 13 were also common wrong answers.

1.2.25. Question 25

Many candidates, in part (a), were able to gain at least one mark for correctly rotating the given shape through 90^{o} in a clockwise direction, although many failed to score both marks as a result of their rotation not having been made about the required centre. Some candidates attempted rotations in each of the quadrants and usually failed to score at all, having made at least one further error.

In part (b), very few candidates scored full marks. Whilst many gained a mark for comments such as "move 3 units to the right and 1 unit down" only a minority correctly mentioned 'translation' in their description. Sometimes incorrect use of a column vector contradicted earlier statements and marks were lost. Surprisingly many candidates miscounted how many squares to the right P had been translated; – 4 or 2 were often seen.

Another common response was "across/along 3 units and down 1". This gained no marks.

A few gave responses such as left 3 and up 1 mapping Q to P by mistake.

1.2.26. Question 26

In part (a), candidates often failed to gain the mark when their explanation was unclear. For example, comments like "because the are the same" are ambiguous. To gain the mark, explanations needed to refer to the sides of the rectangle and not the equation.

As in question 24, algebraic methods were few and far between, many attempts leading to an answer of 6.5 ($2x = 12 + 1$) Some candidates correctly found x to be 5.5 and then tried to use this result to answer part (a). Again, in this question, trial and improvement methods were common.

Having found a value for x in part (b), many failed to use it in an attempt to find the perimeter in part (c). Often just the lengths of two sides were calculated leading to incorrect answers of 11 (5.5 + 5.5) or 46, the sum of the two longer sides.

1.2.27. Question 27

The understanding of this topic is mixed. Clearly many candidates are confused with the terminology of side/front elevation and plan in part (a), very many simply copying one of the two elevations shown.

In part (b), attempts at a 3-D sketch were generally good and many candidates scored at least one mark in this part.

1.2.28. Question 28

Most candidates were able to gain some marks in this question. Often the loss of marks reflected the lack of comprehension or carelessness in reading the question. Some gave answers to part (a) in part (b) and to a lesser degree vice versa. In part (a), many candidates asked a suitable question but failed to give response boxes for the alternative replies.

In part (b), failure to quote a time period or giving over-lapping response boxes were the main reasons why marks were not awarded. Candidates should ask themselves the question "Could I put my tick in more than one box?" If the answer is 'yes' then the response boxes are over-lapping and therefore need correcting.

Many candidates mixed up their responses to 28(a) and (b) or tried to combine them into a longer series of questions.

1.2.29. Question 29

In part (a), 57% gave the correct answer. Parts (b) and (c) were less well done, with incorrect positioning of the decimal point accounting for the majority of the errors made.

1.2.30. Question 30

It is true to say that performance in part (a) was better than that in part (b), however this question was, in general, not well answered. In part (a), one .mark could be gained by correctly finding a half of 72; many failed to get any further than this, usually dividing 36 by 2 to give 18 as their final answer. Some tried to find the square root of 72 and then divide the result by 2

Many candidates simply did not know where to start in part (b), often simply quoting factors of 72. Any attempts at drawing a factor tree often resulted in the award of one mark, but few completed the process to a correct conclusion. Answers of $2 \times 2 \times 2 \times 9$ and 2, 2, 2, 3, 3 and 2+2+2+3+3 were seen on a number of occasions.