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Examiners' Report November 2009

GCSE

GCSE Mathematics (1380)

Foundation Non-Calculator Paper (1F)

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November 2009

1. PRINCIPAL EXAMINER'S REPORT – FOUNDATION PAPER 1

1.1. GENERAL COMMENTS

1.1.1. This paper proved to be accessible and many questions were answered very well. These questions were distributed throughout the paper.

1.1.2. Candidates seemed to find the time allowed sufficient to attempt all questions on the paper.

1.1.3. The vast majority of candidates seemed to have the equipment needed for the examination. Though most candidates appeared to have access to a protractor, there was some evidence that a significant proportion of them could not use it properly in the context of bearings where the angle is measured from the north line. A few candidates used a pen instead of a pencil for diagrams and so found it difficult to make changes to their answers. This was evident, for example, in the question on bearings.

1.1.4. It is heartening to report that most candidates showed their working clearly in the spaces provided.

1.1.5. Noticeable weaknesses in candidates' answers included the questions on adding fractions and calculating surface area.

1.2. REPORT ON INDIVIDUAL QUESTIONS

1.2.1. Question 1

This question was very well answered with nearly all candidates able to answer parts (a) and (b) correctly. Part (c) was also well answered. However, some candidates mistakenly found the time when the temperature was 11·25°C rather than 11·5°C. Though a small minority of responses to part (d) addressed the change in temperature over the whole time period represented on the graph and not the period from 3pm to 8pm, or simply stated the temperature at 3pm and 8pm, 94% of candidates did describe the decrease in temperature with enough clarity to be awarded the mark available here.

1.2.2. Question 2

The three parts of this question attracted success rates of 96%, 88% and 71% respectively. Occasionally candidates rounded 2493 down giving an answer of 2400 rather than the 2500 required in part (b). In part (c) answers of "4000" and "thousands" were accepted.

1.2.3. Question 3

The vast majority of candidates understood the operations needed to solve part (a) of this question. 87% of candidates were completely successful. A further 7% scored one mark. A large proportion of these candidates gave "26" as the answer. Evidence from these candidates suggested that most had made an error in calculating 27 − 18, with 11 often seen in the working space. Part (b) was less well answered. Correct answers were often seen without any working shown. Common incorrect answers included 6, resulting from halving 24 and halving again, so finding a quarter rather than a third. Some candidates added 6 to 12, finding three-quarters of 24.

1.2.4. Question 4

Candidates showed a good understanding of the pictogram in their responses to this question. Some candidates found it difficult to draw the symbol. However they did convey clearly their intention to draw a half symbol in part (c) so were awarded due credit. 94% of candidates answered part (a) correctly, 96% of candidates answered part (b) correctly and 92% of candidates scored both marks in part (c).

1.2.5. Question 5

It is heartening to report that very few candidates reversed the order of x and y co-ordinates in their answers to this question. Nearly all candidates answered parts (a) and (b) correctly. A small minority of candidates marked C on the x axis at (−2, 0). Some candidates left this part of the question unanswered.

1.2.6. Question 6

This question was very well answered with success rates of 96%, 84% and 90% respectively in parts (a), b(i) and b(ii).

1.2.7. Question 7

The first two parts of this question differentiated well between lower attaining candidates. Almost all candidates could correctly order the numbers in part (a). Most candidates could also order the directed numbers in part (b) with only a small minority giving −3°C as the smallest temperature. However, part (c) proved to be more challenging with some candidates listing the numbers with 3 decimal places first followed by those with 2 decimal places and finally 0·3. Other candidates ordered the decimals from largest to smallest. Only 39% of candidates answered this part correctly.

1.2.8. Question 8

Nearly all candidates were able to measure the length of the line accurately in part (a) and 93% could also locate the point 3 cm from A in part (b).

1.2.9. Question 9

Only 38% of candidates were able to state the correct order of rotational symmetry for the regular pentagon. A large proportion of the remaining candidates gave the order as 1. Most candidates drew a correct line of symmetry as their response in part (b), usually the vertical line. Sometimes additional lines of symmetry were added but as these were usually accurate, the mark was still awarded. Some students did not mark any lines of symmetry on the pentagon. Part (c) was very well answered with a 99% success rate. Candidates should be advised to ensure that the outline of a shape drawn shows clearly on grid lines - shading or hatching of the completed diagram is helpful.

1.2.10. Question 10

The first and last parts of this question were well answered. Candidates showed a good understanding of the need to evaluate brackets first. However "8 − 2 × 4" was much less well understood and just as many candidates gave the incorrect answer "24" as gave the correct answer, “0”.

1.2.11. Question 11

About 2 in every 3 candidates were able to change 2·5cm to mm. It was not unusual to see 0·25, 20·5 or 250 on the answer line. A large number of candidates gave 200 as their response in part (b). Only 44% of candidates gave the correct response.

1.2.12. Question 12

Though some candidates did not complete the table in part (a), the vast majority of candidates did complete it successfully and were also able to identify the flavour of crisp which had the highest percentage sales. Examiners were able to award 71% of candidates the two marks in part (c) for writing 25% in its simplest form. A further 13% of candidates were able to gain 1 mark for a fraction which had not been fully or correctly simplified. Part (d) was answered well and candidates usually employed the method of finding 10% of 200 and then doubled this. Incorrect responses seen included 20, 80 and 40%.

1.2.13. Question 13

This question on reading scales was well answered, particularly part (b). In part (a) unacceptable answers included values between 6 and 7, for example 6·5 in part (i), and values over 120, for example 125 in part (ii). 125 was often seen.

1.2.14. Question 14

The accurate drawing of a right-angled triangle in this question was done well. It is encouraging to report that nearly all candidates seemed well equipped to ensure that the 90° angle and two sides were drawn within the tolerances of ±2° and ±2mm allowed. Any loss of marks was usually due to the length of a side being outside the tolerance allowed. Some candidates recreated the given diagram and so could only be awarded the mark for the angle.

1.2.15. Question 15

This question was generally well done with a large proportion of candidates obtaining all 3 marks available for the two correct probabilities. They were usually given as fractions. There was a significant minority of candidates who used incorrect ratio notation in their answers. Centres are reminded to stress to candidates that probability answers must be given as fractions, percentages or decimals. Some candidates gave the responses $\frac{4}{3}$ and $\frac{3}{4}$ in parts (a) and (b) respectively or used expressions such as 'evens' or 'likely' or 'unlikely'.

1.2.16. Question 16

It was disappointing to see more candidates giving $\frac{4}{12}$ or $\frac{1}{3}$ as their answer than gave the correct answer, $\frac{5}{8}$. Incorrect answers had usually been derived from merely adding the numerators and adding the denominators. Some candidates realised the need for the use of a common denominator but failed to convert their fractions correctly. $\frac{3}{8}$ + $\frac{1}{8}$ and $\frac{3}{16}$ + $\frac{1}{16}$ were commonly seen. Some candidates correctly evaluated the sum of the two fractions but then failed to simplify their answer. Only 35% of candidates gained any marks in this question.

1.2.17. Question 17

Well over half of all candidates obtained full marks for their answers to this question. Only 6% of candidates gained no marks at all. Part (a) of the question was answered very well although a significant number of candidates were unable to evaluate 15 × 6 accurately. Part (b) was not answered quite so well with a large proportion of candidates choosing the incorrect operation of multiplication. It is a pity to report that few of these candidates were able to recognise that their answer was unreasonable. Those candidates who did correctly realise the need to divide 75 by 25 could not always carry out the division accurately.

1.2.18. Question 18

Part (a) was answered correctly by 76% of candidates. Incorrect responses seen included answers where the zero was placed between the 1 and the 7 or between the 3 and the 1 in 17316. In part (b) there were several commonly seen incorrect answers with 17·316 perhaps being the most frequently occurring. Just over half of all candidates answered this part correctly.

1.2.19. Question 19

This question proved to be a good discriminator. The table of values was often completed accurately, though working out the value of y when $x = -2$ proved to be too challenging for a significant proportion of candidates. Weaker candidates gave 3, 4, 5 as their values for y corresponding to $x = 1, 2, 3$. A surprising proportion of candidates failed to attempt part (b) of this question. If the table had been completely correct in (a), the line was also often drawn correctly but a significant minority plotted the points without joining them. Few candidates were able to use their graph to find y when $x = -1{\cdot}5$. Many could not cope with the negative sign and read from $x = 1{\cdot}5$ on their graph. Attempts at part (ii) were more often correct. Some candidates used the equation rather than the graph in part (c). Where this led to the correct answer, this method was accepted.

1.2.20. Question 20

Very few candidates sitting this paper showed any understanding of bearings. In response to a request for a bearing in part (a) many gave the length of the line AB. Answers of 120° and 240° were also commonly seen. A minority of candidates were able to mark the position of C accurately in part (b) though many gained one mark for marking C at a distance of 4cm from B. A common error candidates made was to draw a line of length 5cm, possibly obtained by measuring from the 1cm mark on their ruler, or by using the radius of their protractor. Measuring the bearing from an easterly direction in an anticlockwise direction, or marking C north from B or on the line extended from B was not uncommon. Only 12% of candidates obtained all 3 marks available in this question.

1.2.21. Question 21

Examiners were generous in the interpretation of candidates' answers in part (a) of this question and awarded the mark as long as the candidates conveyed that a comparison of the size of the sectors was being made. Many candidates compared 1996 and 2004, failing to properly read the question or just rephrased the question without saying how this was shown on the pie chart. In part (b), whilst a sizeable minority of candidates realised that the numbers of medals being won was the key to an adequate explanation, many candidates argued that Ben was in fact correct. Some attempted to support their

argument with a statement comparing the size of sectors. The lack of clarity in explanations hampered candidates in this question.

1.2.22. Question 22

A well answered question. 90% of candidates plotted all the points accurately. Candidates who failed to gain 2 marks here included those who joined the points using a curve, those who drew a line of best fit and those who plotted the points but stopped there.

1.2.23. Question 23

This question was quite well done. The most common and the most successful method involved using partition - often know as the "grid" or "box" method. Candidates using this method often gained method marks even where their final answer was incorrect. Some candidates showed a lack of understanding of place value – this was particularly true of those few candidates who attempted to use a "traditional" long multiplication method. Two thirds of candidates scored full marks with a further 1 in 10 candidates scoring partial credit. It was not uncommon to see a misread of 432 × 12. The use of the method of repeated addition rarely led to a correct answer.

1.2.24. Question 24

In part (a) the mark scheme rewarded candidates who drew a triangle with at least one side 3 times as long as the given triangle. This part of the question was generally well done though there was a significant number of candidates who added 3 units on to each of the two shorter sides. Part (b) was also well done with 76% of candidates being awarded 2 marks. Some candidates reflected the triangle in the x-axis. Candidates who did this accurately were given some credit, as were candidates who reflected the triangle in $x = c$ ($c \neq 0$). Part (c) of the question proved to be a good discriminator. Most candidates gained some credit for their answers, having drawn a triangle with the correct orientation but not in the correct position. The use of tracing paper had clearly helped many of the 39% of candidates who scored full marks here.

1.2.25. Question 25

This question again proved to be a good discriminator. Most candidates were able to gain some marks by giving at least one criticism of the question or by making at least one improvement to the question. A significant proportion of candidates did not include non-overlapping response boxes in their question but did make two improvements to the question in part (b) to gain both marks available here. Many candidates commented that "not everyone has a contract" in part (a). However, this could not be given any credit as the question needed to be suitable for all mobile users independently of how they paid for their calls. Despite the £ signs shown, some candidates related their answers to the amount of time, rather than money spent, using a mobile phone. A few candidates offered data collection sheets rather than a question in part (b).

1.2.26. Question 26

This question was very poorly attempted with most candidates calculating the volume of the cube. A significant number of these candidates stated the units as cm^2 so were able to gain 1 mark. Some candidates worked out the total length of all the edges of the cube. Other common errors included multiplying the length of an edge by 6 or multiplying the perimeter of a face by 6. Only 20% of candidates gained 3 or more marks for their responses to this question. More than half of candidates scored no marks at all.

1.2.27. Question 27

This question was answered well by higher attaining candidates. Any formula equivalent to $N = 4p + 20b$ was accepted for full marks. Most candidates gave a formula rather than just an expression. Many of them gave the answer $N = p + b$, which was given some credit. Other candidates offered expressions involving the multiplication of variables. To their credit, there were relatively few candidates who gave purely numerical answers. Working spaces often revealed some expressions worthy of credit, but with final answers suggesting a change of mind by the candidate and examiners unable to award any marks as a result.

1.2.28. Question 28

A large proportion of candidates (51%) were able to gain at least one mark for their attempt at this question. Usually candidates were able to gain a mark for correctly rounding the numbers in the numerator. A smaller number of candidates rounded the denominator correctly to 0·2 but relatively few candidates could go on to divide by 0·2 successfully. There was a lack of understanding that this would produce a larger number. The most successful attempts were from candidates who multiplied the numerator and denominator by 10 thus eliminating the need to divide by a number less than 1. Many candidates attempted to work out the exact value of the expression rather than estimate it. This could not be awarded any marks. Only 5% of candidates gained full marks in this question.

1.2.29. Question 29

This question was a good discriminator between higher attaining candidates. A common error in part (a) was to multiply only the first term in the bracket by the y and so give the answer $2y^2-3$. In part (b) only a small proportion of candidates could give a fully correct answer. Part (c) had the highest mark yield of all three parts of the question with 27% of candidates scoring both marks. Another 27% of candidates scored 1 mark, usually for missing one of the required values out of their list, most frequently the −1 or the 2. A good proportion of candidates included 3 in their list. The answer "4" on its

own was commonly seen suggesting that some candidates thought they were being asked for the number of integers in the given range.

2. STATISTICS

2.1. MARK RANGES AND AWARD OF GRADE

Unit/Component	Maximum Mark	Mean Mark	Standard Deviation	% Contribution to Award
1380/1F	100	67.4	16.0	50
1380/2F	100	65.0	18.9	50
1380/3H	100	53.0	20.5	50
1380/4H	100	51.8	22.5	50

GCSE Mathematics Grade Boundaries 1380 – November 2009

	A*	A	B	C	D	E	F	G
1380_1F				78	64	51	38	25
1380_2F				78	64	50	36	22
1380_3H	86	70	52	34	20			
1380_4H	88	71	51	32	19			

	A*	A	B	C	D	E	F	G
1380F				156	128	101	74	47
1380H	174	141	103	66	39	25		

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