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Examiners Report June 2009

GCSE

GCSE Mathematics (1380)

Foundation Calculator Paper (2F)

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1. PRINCIPAL EXAMINER'S REPORT – FOUNDATION PAPER 2

1.1. GENERAL COMMENTS

1.1.1. A significant weakness running through several questions relates to technical terms or key words. This includes naming angles (Q2), circle parts (Q3), statistical terms (Q6), solids (Q7) and types of number (Q13).

1.1.2. Presentation of answers was a concern on this paper. Candidates need to write their figures clearly enough to be read. For example, it is sometimes unclear as whether a digit is a 4 or a 9; 0 and 6 are also sometimes not clear, as are 5s and 6s in some respects. Correct money notation needs to be used, and candidates sometimes confuse the use of commas and decimal points. Candidates who work in pencil frequently rub out valuable working, and their work is far less legible than a candidate who works in black ink. Work presented in red or coloured ink is frequently illegible. The proportion of candidates who present only answers without working run the risk of no marks awarded (if the answer is incorrect).

1.1.3. Rounding is a problem for many, particularly when the calculator display shows many digits and candidates choose not to write down all the numbers. Essential advice for candidates in this context is to always write down the full version of the number and then round.

1.1.4. Most centres correctly advise candidates to have the correct equipment for an examination. Many candidates did not have a compass (evidenced in Q3, 19) or a calculator (evidenced throughout). Candidates should be taught how to use calculators sensibly: always write down the numbers and operations they put on the calculator, and copy the full display; write the final answer with correct notation, ensuring it is a sensible answer.

1.1.5. The use of algebra continues to be a weakness. This was highlighted when candidates were substituting numbers incorrectly into algebra (Q18) or manipulating basic algebra (Q23).

1.2. REPORT ON INDIVIDUAL QUESTIONS

1.2.1. Question 1

This was a well answered question with most candidates scoring full marks. Occasionally candidates lost marks in part (b) by giving the incorrect answer of £3.5, or in part (c) by confusing the use of commas and decimal points (eg 3.510)

1.2.2. Question 2

Most parts of this question were well attempted, errors coming from not understanding the technical terms. For example in part (b) a minority of candidates marked obtuse angles. In part (c) it was important to draw a shape in which examiners could identify two pairs of sides that were approximately the same length, but those candidates who failed to use the grid as a guide, or whose diagrams were so roughly drawn failed to make this clear.

1.2.3. Question 3

In part (a) it was obvious that many candidates did not have a compass, and therefore wasted this mark. Those who did have a compass usually presented an accurate circle. In part (b) it was surprising the number of candidates who failed to draw a diameter. A common error was predictably the drawing of a radius, but many drew the diameter as a chord, perhaps through the letter C rather than the centre X, or left the question blank.

1.2.4. Question 4

Most candidates gained full marks on this question. Where they did not it was usually due to misunderstanding or misreading of the question or simple mathematical errors. In (b) it was not uncommon to see the answers embedded in working, or shown as seven £8.65s added up in working without the answers "7" on the answer line. Examples of errors in (c) include calculations for 1 adult and 1 child, or incorrect/missing subtraction of £18.45 from £20 in part (c).

1.2.5. Question 5

A well answered question in which the only mark lost was usually in part (d). In this part it was the quality of the explanations on which the mark was awarded. Failure to mention the significance of the "3" usually rendered the explanation incomplete.

1.2.6. Question 6

Parts (a), (b) and (d) were usually completed well. It was unfortunate that a significant number of candidates failed to attempt part (a), which is inexplicable. In part (c) many candidates did not understand the term "mode" , and some put "10" rather than the colour as requested.

1.2.7. Question 7

Poor spelling was not penalised as long as the word could be unambiguously associated with the solid. Nevertheless it was disappointing that 20% of candidates were unable to name these common solids correctly.

1.2.8. Question 8

Most candidates gave $\frac{9}{12}$ as their initial response, but not all cancelled their fractions correctly. Part (b) was also well answered. Only 50% of candidates were able to give this common fraction as a decimal, with many giving incorrect answers such as 3.0, 0.03, or failing to attempt the question. Part (d) was answered far better.

1.2.9. Question 9

This was a well answered question. The only common errors was not placing the ruler correctly on A, measuring the distance between the letters A & B rather than the line AB, and placing the midpoint inaccurately "by eye" rather than by measuring.

1.2.10. Question 10

Parts (a) & (b) were well answered. There were a few minor slips in tallying, and the frequency column was sometimes misplaced, but rarely inaccurate. Part (c) was poorly answered. Many misunderstood the term "range", whilst a significant minority calculated this from the frequency (7-1).

1.2.11. Question 11

Those candidates who showed their method in part (a) usually wrote 6×3+4; too many incorrectly calculated 6×3. In part (b) the most common error was to divide 52 by 6 and then subtract 4, but many failed to show any working.

1.2.12. Question 12

This was a well-answered question in which the only errors concerned using scales.

1.2.13. Question 13

Part (i) was well answered. However, in parts (ii) and (iii) there was much miss-understanding of the terms "factor" and "prime". In the former candidates chose numbers that were not factors, or 42, and in the latter chose numbers that were not prime numbers.

1.2.14. Question 14

Part (a) was answered correctly by the majority of candidates. Part (b) was less well done, with some candidates trying to identify a further case of reflective symmetry. A significant minority of students answered (a) and (b) the wrong way around.

1.2.15. Question 15

Candidates were generally successful in calculating the unit fraction of the amount, but there were many errors in calculating 2/9 of 36. Those candidates who attempted to add the two fractions usually made errors, with many giving the sum incorrectly as $\frac{3}{15}$ after adding both numerators and denominators. Once fractions had been added candidates became unstuck as to where to go next with the solution, generally giving the complimentary fraction as the final answer, thus failing to interpret the context of the answer.

1.2.16. Question 16

Performance on this question was poor, with only ¼ of candidates scoring significant marks. Angles or calculations leading to angles were rarely shown; many pie charts appeared to have been drawn only roughly in proportion to the figures, but scored no marks as the angles, when measured, were rarely accurate. Some inaccuracies arose due to sectors being drawn freehand. Labelling showed some improvement, but without some accurate angles did not attract marks on their own.

1.2.17. Question 17

It was surprising how many candidates gave an incorrect answer for this question. It was clear that many did not have calculators, and struggled to multiply the three figures together; many answers suggested that a significant number resorted to guessing the answer. Some attempted to add the numbers, suggesting they did not know how to calculate volume, or were trying to find the edge length.

1.2.18. Question 18

Many candidates struggled with the algebra in this question. Many attempts at substitution were spoilt by incorrect use of operations (eg 1.8+-8 in part (a)) or incorrect transcribing of negative values. In part (b) few gained a mark for substitution by not writing the full equation; though some got as far as stating the 36. Many answers showed no working in either part.

1.2.19. Question 19

Many candidates did not attempt this part, and few earned marks. It was clear that many did not understand the term “bisect”. Some drew a line through the angle, but it was hardly a bisector. Some who had a compass started by drawing a pair of arcs, but then could not progress the solution.

1.2.20. Question 20

The majority of candidates gained full marks for this question. The main misconception was in the operations required, and it was not uncommon to find candidates applying the operations the wrong way around in (a) and (b). Again the absence of a calculator was an inhibitor, leading to complex multiple addition and subtraction methods which rarely gained any marks.

1.2.21. Question 21

Most candidates gained marks in this question. Plotting was done in part (a) with relative ease, but the descriptions in part (b) sometimes lost marks because they were not general enough: commenting on a single point will not earn the mark. In part (c) candidates were expected to make a reasonable estimate which in many cases gained marks, with or without a line of best fit. In some cases it was cleat the candidate was filing to see their answer within the context of the problem, for example giving an answer less than 70.

1.2.22. Question 22

In part (a) there were many correct diagrams drawn and the vast majority of candidates scored at least one mark for drawing a diagram which shows at least two of the sides enlarged correctly. Some gave an enlargement that was scale factor 3. In part (b) performance was much worse. Some recognised this as a reflection, but few stated the line of symmetry. Many appeared to think this was a rotation. Others use common language such as "flipped" or "mirrored" rather than the correct description of "reflection".

1.2.23. Question 23

Even basic algebra was a weakness on this paper. Only about half the candidates were able to simply the expression in parts (a) and (b), with the performance far worse in parts (c) and (d). In part (a) candidates were just guessing, giving answers such as m^4 and 4^m, and in (b) pq^4 and incomplete expressions such as $pq\times4$ or similar.

In (c) many did not know what to do with the 5. Many added it, others doing a partial expansion leading to $15x$, $15x-2$ or $15x+5-2$

In part (d) few gave any reasonable answer, with a plethora of terms associated with 3, y and 4, but with little recognition of what was needed when multiplying. In some cases correct answers were spoilt by incorrect and unnecessary further simplification, such as $15y^2$.

1.2.24. Question 24

In part (a) the vast majority of candidates scored a mark for a ratio of 18:12 or equivalent, despite some failing to correctly cancel the ratio, or gave the ratio the wrong way around. There were many correct answers. In part (b) some candidates successfully calculated the ratio of oranges to apples as 9:45 but chose 9 as their final answer. The weaker candidates divided 54 by 5 and rounded the answer to 11.

1.2.25. Question 25

Very few candidates earned any marks for this question, which was designed only for the more able at the Foundation level. 80÷5=16 was the most common error, but few considered using midpoints. Many failed to attempt the question.

1.2.26. Question 26

A surprising number of candidates correctly answered both parts of this question. Though t^{12} was common, more gave the correct answer. The success rate was even higher in part (b), showing that work on indices is certainly accessible to Foundation students.

1.2.27. Question 27

The advice given to many candidates is to calculate the numerator and denominator separately before dividing to get the final answer. This advice was ignored by many candidate who just put the numbers into their calculator in the order given in the question and hoped for the best, which was usually no marks as a result. A significant number doubled 3.2 rather than squaring. In part (b) most students did not understand what 1 significant figure meant, and gave their answer to 1dp instead. Many who gave a negative answer in (a) rounded their answer to a positive answer in (b).

1.2.28. Question 28

Very few correct answers were seen. The errors made by candidates were many and common, including incorrect choice of formula to use (πr^2 quoted and used incorrectly) use of 8 as a radius, incorrect values of π used (though given on the front of the paper), failure to divide by 2, and leaving the answer as the arc, without adding on the straight edge to give the total perimeter.