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Principal Examiner Feedback

Summer 2010

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. Almost all the candidates that were entered for this paper found it accessible.

1.1.2. The majority of candidates attempted nearly all the questions, as blank responses were only seen for question 24 onwards.

1.1.3. It was a pity to see so many candidates using non-calculator methods to solve multiplication and division problems as they had not turned up to the exam with a calculator. Also missing was the correct equipment for drawing straight lines and circles, evidenced by many candidates drawing straight lines and the circle, freehand.

1.1.4. The quality of the algebraic manipulation was very poor with many candidates making elementary errors in their attempts to simplify expressions. A surprising number of candidates tried to solve linear equations using Trial and Improvement methods usually with little success.

1.1.5. Questions 1 – 10, 14, 15 and 20 were tackled with the most success.

1.1.6. Questions 17 – 19, 21(b) and 23 – 27 were less successfully completed.

1.2. REPORT ON INDIVIDUAL QUESTIONS

1.2.1. Question 1
This question was very well understood and very well answered with over 90% of candidates gaining all four marks. Parts (a) and (b) were about interpreting the scale and part (a) was correctly answered by 98% of candidates and part (b) was correctly answered by 95%. When candidates had to draw the representations the success rate was still 98% in part (c) where 2 whole shapes had to be drawn but dropped to 93% in part (d) when 1½ shapes were needed .

1.2.2. Question 2
Though this was a well understood topic a surprising number of candidates wrote £2.80 as £2.18 or £20.80 and, not surprisingly, the most common wrong answer to writing £2.06 was to write £2.6 or £20.06. The addition of an extra p at the end of the pence was condoned as was using a comma as a delimiter between £ and pence. 8% of candidates made an error in (a) and 15% in (b).

1.2.3. Question 3

Candidates frequently made mistakes in answering part (a) of this question. Common mistakes in writing the names of the 3-D shapes were to write common items rather than their mathematical name e.g. box instead of cuboid, ball instead of sphere and triangle instead of pyramid. Many candidates also wrote prism instead of pyramid in (iii). Part(i) had a 68% success rate, part (ii) had 69% and (iii) had 47%. In part (b) the success rate was 77%, showing a good understanding of counting cubes to find a volume.

1.2.4. Question 4

This was a well understood question with 95% of candidates gaining the mark for correctly interpreting the number machine in the given directions whilst 92% of candidates scored one mark for interpreting the diagram in the reverse direction.

1.2.5. Question 5

This probability question was very well understood with 87% of candidates able to write likely or certain for the sun shining in July, 92% writing even chance for a baby being born next and 95% realising there were would not be 50 days in a month.

1.2.6. Question 6

This question was poorly answered as in part (a) the number of candidates with a pair of compasses was lower than we might have expected and so failed to gain the mark for drawing a circle within the tolerance of ± 2mm. Many drew the circle with O as the centre rather than the cross labelled O. A surprising number of candidates could not correctly identify a pair of parallel straight lines with arrows and but almost all candidates could correctly indicate a right angle. Overall only 48% gained all 3 marks for being able to answer all parts correctly with 31% gaining 2 marks for two parts correct and 15% gaining one mark for one part correct. Only 7% of candidates gained no marks.

1.2.7. Question 7

Candidates on the foundation tier do tend to struggle with writing a sensible unit and especially get confused by imperial units. This question was typical with only 79% being able to write mm, cm or m for a unit to measure the height of a door, 74% being able to correctly identify stones or pounds for the weight of a man and 83% writing ml, cl, cm³ or litre for the volume of water in a bucket. Candidates often gave a numeric estimate rather than the unit that should be used.

1.2.8. Question 8

This question was also well answered with 80% of candidates being able to write 25 for 5^2 though 10 was a common wrong answer from those candidates who though squaring 5 was 5×2 however the success rate was not quite so good for the square root of 3.24 with 59% gaining the mark. Many candidates squared this as well and some squared it and then found the square root and so ended up back where they started from.

1.2.9. Question 9

This question too was extremely well understood with 90% of candidates gaining both the mark for the missing term 19 and were then able to explain they need to add 3 to find the next term from the original sequence. 9% of candidates gained one mark so only 1% of candidates gained no marks.

1.2.10. Question 10

Candidates did struggle with this question often because of lack of equipment. Frequently the symmetry lines were drawn without a ruler and consequently were out of tolerance. 59% of candidates did draw both of the lines correctly with a further 33% gaining one mark either for drawing in one line correctly or for drawing in the two lines of symmetry and then incorrectly adding the diagonals for good measure. Rotational symmetry was also poorly done with 51% of candidates gaining the mark for the regular pentagon and 54% of the shaded triangle.

1.2.11. Question 11

This question was well understood and 94% of candidates were able to correctly give the correct readings of the positive and 87% of the negative values in the thermometers. Many candidates gave the reading of 18 as 15.3 and of -6 as -4. Writing the lowest temperature in the table was successfully completed by 96% of candidates though more mistakes were made in finding the difference between two temperatures with the success rate dropping to 61%.

1.2.12. Question 12

Though shading the fraction of a rectangle is a well known concept only 88% were successful. Many candidates wrote $\frac{5}{7}$ or $\frac{5}{16}$. In parts (b) and (c) only 46% did get the questions completely correct with 19% of candidates obtained 1 mark, usually for writing $\frac{3}{10}$ whilst 16% gained 2 marks and a further 13% scoring three out of the four marks available. Part (c) was the least successful with candidates often dividing by to obtain 16 and then wrote 16 on the answer line or went on to divide 16 by 2 again to give 8.

1.2.13. Question 13

Candidates understood what to do with this question but unfortunately they frequently lacked the calculator to obtain the correct answer. In part (a) many candidates adopted trial and improvement methods, usually unsuccessfully, and some used repeated addition to try to obtain the answer. In part (b) many candidates were able to gain some credit for showing they needed to take their total from part (a) from £20 but often incorrectly wrote the change as 5p rather than 45p. A small number of candidates who did not show their working wrote an answer of 0.45p and so lost both marks. Fully correct answers to this question were seen in 54% of cases whilst 3 marks were obtained by 9% of candidates. 2 marks were successfully obtained by a further 14% and one mark was given to 4% of candidates. It was a pity that 20% of candidates did not obtain any marks.

1.2.14. Question 14

Candidates understood this question and 81% of candidates were able to gain all 3 marks in part (a) for completing the two-way table correctly. A further 4% gained two marks for making one or two errors and 7% gained 1 mark for getting 1 or 2 numbers correct. In part (b) only 33% of candidates were correctly able to write the correct probability of $\frac{6}{50}$. Candidates who incorrectly cancelled this were not penalised. One mark was awarded for candidates who correctly wrote a fraction with a numerator of 6 or a denominator of 50 as long as the fraction was less than $\frac{1}{2}$. The most common partially correct answer was $\frac{6}{11}$. This one mark was also obtained by 33% of candidates.

1.2.15. Question 15

This question was very well understood and very well answered with 41% of candidates obtaining all 6 marks. An error of one mark was made by 8% of candidates and 2 errors by 28%. Most errors were made in part (c) where candidates often wrote the answer to the easy calculation as £57.05 rather than £57.50. Only 3% of candidates failed to score any marks.

1.2.16. Question 16

Solving equations is often a subject that foundation candidates struggle with. In this question the relatively easy part (a) was correctly answered by 55% of candidates whilst the slightly more demanding part (b) was correctly answered by 51% though 2% of candidates obtained one mark for correctly adding 4 to both sides of the equation.

1.2.17. Question 17

This question was very poorly answered with only 9% of candidates being able to give a fully correct answer of 220º. Almost all candidates subtracted 40 from 180 and gave the incorrect answer of 140º whist a few (0.2%) gained one mark for an attempt to find the correct bearing leaving 91% with no marks gained.

1.2.18. Question 18

The context of this question was well understood and parts (a) and (c) were answered correctly by 82% and 89% respectively. In part (b) candidates did struggle to subtract times correctly. The correct answer of 94 minutes was given by 58% of candidates. The most common mistake was for candidates to think there are 100 minutes in an hour and then give an answer of 174 whilst some candidates thought 1 hour 34 minutes was 134 minutes or even 1.34 hours. All these results were given 1 mark and this mark was obtained by 19% of candidates.

1.2.19. Question 19

This question was not really well understood as candidates often misunderstood the division and addition and worked out 2 ÷ 1.5 and then added 2.45 whilst others added 1.5 and 2.45 and then divided the answer by 2. The fully correct answer to the whole question was given by 16% of candidates with 2 marks being obtained by 19% of candidates. One mark was obtained by 28% of candidates either for the sight of 3.95 (the sum of 1.5 and 2.45) in part (a) or in part (b) for writing of the correct answer to part (a) correct to two decimal places. 38% of candidates gained no marks.

1.2.20. Question 20

Scatter graphs are a well understood topic by foundation tier candidates and this question was no exception, only 6% of candidates failed to score any marks. All 4 marks for this question were obtained by 40% of candidates whilst only 33% of candidates lost one mark either for stating that the more rain the more umbrellas were sold rather than answering the given question or for an incorrect reading off the graph. Plotting the extra point on the graph was answered correctly by almost all candidates and estimating from the scatter graph was also well understood. Few candidates saw the need for drawing in a line of best fit as the points were very closely grouped. 10% of candidates scored 1 mark and further 10% gained 2 marks.

1.2.21. Question 21

In part (a) 65% of candidates successfully changed £620 into euros and a further 2% of candidates gained 1 mark for explaining how they were going to do it. Most of the 33% of candidates gave the response of €496 for dividing 620 by 1.25. Part (b) was less successful as candidates were often confused as to what they needed to do. The fully correct answer of £2 was given by 33% of candidates. The mark-scheme allowed a mark for either changing £42 to euros or €50 to pounds (this was obtained by 12% of candidates) and the second mark for showing the subtraction €52.50 – €50 or £42 – £40 was obtained by 4% of candidates.

1.2.22. Question 22

Candidates at Foundation tier are getting better at drawing straight line graphs, particularly, as in this case, when there is a table of values and 35% of candidates were able to correctly complete this table of values and draw the correct graph. When it came to drawing the graph it was disappointing to still see a large number of candidates plotting their values correctly but then not joining up their points with a straight line. One mark was awarded for plotting at least 4 of their points correctly or drawing a line with the correct gradient or intercept on the y axis. This mark was obtained by 16% of candidates. Only 28% of candidates scored no marks.

1.2.23. Question 23

This question was poorly answered by almost all the candidates sitting this paper. In part (a) 61% of the candidates did gain the two marks for finding the missing angle of 140º and in part (b) the missing angle of 112º was found by 27% of candidates. However when it came to giving the reason as to how their answer was obtained it was a different scenario. Only 7% of candidates were able in part (a) to state that angles at a point add to 360º with many candidates thinking the point was a circle and in part (b) only 3% were able to give both reasons to generate the correct angle whilst 29% did manage to give one of the reasons. It was very common to see candidates saying how they worked it out rather than giving a geometric reason.

1.2.24. Question 24

Trial and Improvement methods of solving a polynomial equation are a frequent visitor on these papers and surprisingly only 5% of candidates gained all 4 marks on this topic that is in the grade C descriptor list. 16% of the candidates gained 3 marks because they missed out the trial halfway between 1.8 and 1.9 to determine the correct solution or then did not select the value 1.9 but gave the more accurate answer of 1.86 when the question asked for the answer to be given to one decimal place. Surprisingly for such a well tested topic only 4% of candidates could gain 1 mark for a correct trial of one point which could be the given points 1 or 2 and 72% of candidates gained no marks. A frequent common error was for candidates to multiply their trial by 3 rather than cubing.

1.2.25. Question 25

This question was well understood though many candidates added the probabilities but forgot to take the total away from 1. Part (a) of this question was more successful than some we have set in previous years as we gave all the probabilities to 2 decimal places and candidates were able to add the numbers correctly. 64% of candidates gave the correct answer of 0.2 or any equivalent and 2% of candidates were able to show that they needed to take their total away from 1 and so gain one mark. In part (b) 43% of candidates obtained the fully correct answer and a further 1% gained one mark for showing they needed to multiply 0.3 by 500. The 57% of candidates that gained no mark usually divided 500 by 0.3 or divided 500 by 4, the number of ribbon colours.

1.2.26. Question 26

Here again candidates struggled to give an appropriate geometric reason to explain why the two angles were equal and fully correct answers to the whole question were obtained by 8% of candidates. Two marks were gained by 18% of candidates usually for the correct solution to the equation and one mark was obtained by 14% of candidates, obtained either for collecting the variable or the numbers on one side of the equation. No marks were awarded to 60% of candidates.

1.2.27. Question 27

For a well tested topic it was very disappointing to see the incorrect answer of 84 cm² obtained from forgetting to halve the product of the length of the base and height seen on so many occasions. Only 29% of candidates gave the correct answer of 42 cm² and a further 0.4% gaining one mark for showing their intention to find the area correctly. 71% of the candidature gained 0 marks. In part (b) 18% of candidates gave the correct answer, an improvement on previous years. One mark was obtained by 2% of candidates either for showing intention of squaring and adding or for obtaining 232 and a further 1% gained 2 marks for attempting to find the square root of either 232 or 36 + 196. A surprising number of candidates still seem to think that squaring a number means you double it and we often saw 6² = 12.

2. STATISTICS

2.1. MARK RANGES AND AWARD OF GRADE

Unit/Component	Maximum Mark	Mean Mark	Standard Deviation	% Contribution to Award
1380/1F	100	58.4	18.3	50
1380/2F	100	61.8	18.3	50
1380/3H	100	57.5	21.5	50
1380/4H	100	61.7	19.3	50

GCSE Mathematics Grade Boundaries 1380 – June 2010

	A*	A	B	C	D	E	F	G
1380_1F				75	60	45	31	17
1380_2F				78	63	48	34	20
1380_3H	89	69	49	30	18	12		
1380_4H	90	72	54	36	21	13		

	A*	A	B	C	D	E	F	G
1380F				153	123	94	65	36
1380H	176	141	103	66	39	25		