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Principal Examiner Feedback

Summer 2010

GCSE

GCSE Mathematics 2381

Foundation Non-Calculator Paper (11F)

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1. PRINCIPAL EXAMINER'S REPORT – FOUNDATION PAPER 11

1.1. GENERAL COMMENTS

1.1.1. The paper proved to be accessible to most candidates with the majority of the candidates attempting all questions.

1.1.2. Candidates appeared to be able to complete the paper in the allotted time.

1.1.3. Presentation was generally good. However, a few candidates used pens of a different colour, or wrote very faintly. This caused problems in both written and diagrammatic questions after scanning.

1.1.4. A good number of candidates showed working out which was a good improvement from previous years. This resulted in some method marks being awarded.

1.1.5. A small number of papers had working outside of the scanned area, in particular in the right-hand margin, which caused problems.

1.1.6. Poor arithmetic was much in evidence on this paper with simple addition and subtraction frequently done incorrectly.

1.2. REPORT ON INDIVIDUAL QUESTIONS

1.2.1. Question 1

Part (a) proved to be a disappointing starter question with only 60% of the candidates getting the subtraction correct. Even fewer got part (b) correct with –1 being a very common incorrect answer. Part (c) had the highest success rate with over 90% getting 6.77 whilst 23% of the candidates were not able to divide 100 by 20 successfully. The most common error in (d) was an answer of 50, where the candidates had done 100 ÷ 2 instead of dividing by 20.

1.2.2. Question 2

Over 90% of the candidates could measure the line correctly bur only 63% could measure the angle correctly. Many clearly did not use a protractor with many estimates of 45°, etc whilst others wrote 145°.

1.2.3. Question 3

Most candidates gave the fraction $\frac{44}{50}$ to get one mark in (a), but many incorrect final answers came from over-enthusiastic cancelling, to get $\frac{11}{12.5}$. Many did not attempt to simplify $\frac{44}{50}$ at all.

Many candidates found (b) difficult to answer. A common incorrect answer given was 33%. There was little evidence of an attempt to write as a fraction out of 100 or writing 33 ÷ 50 × 100 which would have gained the first mark. Only ¼ of the candidates scored all 4 marks in question 3 with ¼ scoring 2 marks and 21% scoring 0 marks. The importance of showing working needs to be emphasised, because marks were lost when students gave answers only, which were not correct.

1.2.4. Question 4

This was well done. Over 98% of candidates managed to get correct matches, with very few joining shapes with more than one line, or missing lines.

1.2.5. Question 5

Generally, the question was well done with over 80% scoring both marks. There were far too many simple errors in subtracting 12 from 42 with answers like 16 and 20 appearing on the answer line, (from 42 – 12 = 32, 32 ÷ 2 = 16 and 42 – 12 = 40, 40 ÷ 2 = 20 respectively.) Most students who showed working managed to score a method mark. Very few students tried to use algebra to answer the question, but a few flow diagrams were seen. Some embedded answers were also seen, with incorrect or no transfer to the answer line, and only partial credit could be given.

1.2.6. Question 6

This question was tackled well, with 75% of the candidates achieving full marks. Most candidates divided 55 by 5, or showed the number 11 for a method mark, with a few adding the seven 11's incorrectly. Some candidates started with by multiplying seven 55's or showing the figure 385. Of these, few went on to divide by the 5 to get the final answer of 77. Candidates are advised to check that their answers are reasonable eg 7 pencils would not cost £3.85 given the price of 5 was 55p.

1.2.7. Question 7

Unfortunately over 35% failed to score on this question. Candidates struggled to reach the final step in part (a) to show the addition to $4x$. Many could state Bag A and Bag C had x and Bag B had $2x$ but they then did not show that the sum led to $4x$. For others, the concept of 'twice' caused algebraic confusion with x^2 and xx being shown. Part (b) was well answered, with around 60% of the candidates gaining both marks. Many candidates just put the answer on the answer line, but partial credit could be gained for an incorrect answer if a correct method was shown. Of these, there were many, but the most common incorrect method was $28 \div 3$. Unfortunately over 35% failed to score on this question.

1.2.8. Question 8

Drawing an accurate isometric cuboid was well attempted with over 80% of the candidates obtaining both of the marks, or 1 mark where any cuboid was drawn. Incorrect answers showed an inability to utilize the isometric paper at all, or an attempt to draw a net. The success rate for calculating the area of the top face was much less high, with the most common incorrect answer being 24 (volume) with calculation of perimeter also frequently seen. As many answers were given with no workings shown, the method mark could not be awarded.

1.2.9. Question 9

Nearly all candidates managed an addition of the weights in (a), often by splitting into 500 + 500 and 600 + 600 with a final addition often coming to 2200 which was then shown as their final answer. Converting to kg proved problematic for many, and since so few showed their method for this part, it was difficult to know whether it was because the conversion factor was unknown or because there had been errors in the arithmetic. Only 30% of the candidates scored all 3 marks. In (b) most candidates were able to identify the correct items to add but the 2×1.85 caused problems with many reaching £2.70 leading to a final answer of £5.49. If an error was made, it was often in adding only one amount of £1.85 which achieved the Special Case B1 mark when evaluated correctly. Candidates should be encouraged to write down the numbers that they are adding to ensure that method marks can be awarded. It was disappointing to note that only 66% of the candidates were able to accurately work out how much Ed spent.

1.2.10. Question 10

A poor understanding of algebra, lead to many answers of 3m in part (a) with only 45% obtaining the correct answer. In (b) 2*k* was often evaluated as 25 leading to the incorrect answer of 37. Simple arithmetic errors also cost the accuracy mark where 10 + 12 was frequently given as 24 or 32. Candidates also struggled to manipulate the algebra in (c) where the two common errors were to either to substitute 22 for *W* leading to an answer of 86, or to fail to reverse the –2 operation and perform 22–2 then divide by 4 resulting in an answer of 5. Had 22 = 4*W* – 2 been shown at the start of this method, 1 mark was achieved. Overall 30% failed to score in parts (b) and (c) contrasting with over 36% who scored all 4 marks.

1.2.11. Question 11

Calculating the real distance from A to B in (a) was achieved by most candidates. At least 1 mark was achieved by showing the method of 6 × 4 although poor multiplication frequently led to answers of 20, 28 or 32. Part (b) proved much more challenging with many candidates dividing 24 by 6 and then multiplying by 2 rather than dividing by 2 "because it was twice the amount in cms". Other incorrect responses came from 12 × 4 = 48 or 12 ÷ 3 = 4. The correct answer of 2 was often given with no workings shown. Just over 30% of the candidates scored all 4 marks.

1.2.12. Question 12

This angle question proved troublesome for candidates with 48% failing to score. These candidates often showed 70 on the answer line with no method shown, whereas showing the method 180 – 110 would have earned the first mark, or by putting the 70º in the correct place on the diagram. Confusion as to which angles were the same in the isosceles triangle with "base angles are the same" meant many thought *y* was 70º. Those who realised that it was *PTQ* generally went on to achieve all 3 marks. In (ii) candidates found it difficult to articulate their reasons with many showing workings instead. The equal lengths in the isosceles triangle were often misrepresented as being parallel, and angles in a triangle and/or on a straight line were also stated as 360º degrees. However, over 15% of candidates did identify 2 correct reasons to gain this mark.

1.2.13. Question 13

Candidates fell into two groups in the way this fraction question was attempted. The first found the number of boys, often getting 50 correct (although 300 ÷ 6 = 60 was a very common incorrect answer), the number of girls (finding 30 was often seen but then candidates failed to multiply this by 3), and then added these numbers and subtracting from 300. This approach often achieved 2, 3 or all 4 marks. The second group chose to add the two fractions together (with most getting 4/16 as their answer having failed to get a common denominator) and then subtracting from 1. Candidates who took this

approach generally were stumped at this point, and scored 2 marks. Overall, 48% failed to score and 26% scored all 4 marks.

1.2.14. Question 14

There seemed to be some understanding of the term 'ratio', with candidates appreciating that the £40 needed to be 'shared'. However, having added the 'parts' to 5, candidates then used multiples of this, getting 15 and 25 or 20 and 30, rather than calculating 40 ÷ 5 = 8 and then using the 8. Candidates often scored full marks or no marks as very little creditworthy method was written down. 54% scored 0 marks with 40% scoring all 3 marks.

1.2.15. Question 15

Calculating the co-ordinates (0, –3) and (1, –1) was generally done well in (a) by the more able students but (–3, 3) caused real problems, with (–3, 6) regularly shown in the table. Most candidates, if they managed to complete the table in part (a), managed to pick up a mark in (b) for plotting their points correctly. A surprising number of candidates plotted (–2, –1) at (–2, 1). A very high proportion of candidates failed to draw a curve at all or used a ruler to join the points, particularly between (–1, –3) and (0, –3) thereby losing a mark. The symmetry of the curve was not appreciated, but if it had been, errors such as the miscalculation of (–3, 3) and the incorrect plotting of (–2, –1) would have been picked up.Estimating the solutions to the equation using the graph in (c) proved to be very challenging with candidates not knowing how to utilize their graph to achieve this. Others unsuccessfully tried algebraic methods to calculate solutions. 44% of candidates failed to score on this question, with a further 23% scoring 1 mark overall. Only 6% scored 4 or 5 marks.

1.2.16. Question 16

30% of the candidates managed to get the triangle in the correct orientation, but had rotated around an incorrect point. Others only rotated the triangle 90° but used the correct centre, and also achieved just 1 mark. A further 30% successfully rotated the triangle about the given centre. Of those who failed to score, many reflected the triangle in one of the axes.

1.2.17. Question 17

Most candidates attempted this question, but unfortunately only 3% obtained full marks. Very few candidates identified the transformation as a translation. Most candidates attempted to describe the movement, but many of these were not exact putting "across" rather than 'to the right'. Others either did not specify the direction, or put a fraction line in the vector or gave coordinates. Some simply forgot the negative sign on the 2. A few candidates translated the shape from Q to P, rather than the correct P to Q. Disappointingly 75% of the candidates failed to score.

1.2.18. Question 18

Foundation candidates often struggle with more complex equations and this year was no exception with ¾ of the candidates failing to score. Of those who did score, multiplying out the bracket was generally done well with a good number of these candidates getting $8x - 12$. However, many wrote $8x + 12$ or $8x - 3$. Collecting the like terms proved difficult as candidates failed to use the appropriate opposite sign to ensure elimination or combined their terms incorrectly with poor arithmetic. Those candidates who got to 19/3 were not penalised for subsequent incorrect simplifications or conversions to decimals. A significant number of candidates left their answer as $3x = 19$ or struggled to find x having found $3x = 19$. A small number tried to solve this equation by dividing by 4 first, but this did not prove to be a successful choice.

2. STATISTICS

2.1. MARK RANGES AND AWARD OF GRADE

Unit/Component	Maximum Mark (Raw)	Mean Mark	Standard Deviation	% Contribution to Award
5381F/05	30	19.2	5.8	20
5381H/06	30	20.3	6.5	20
5382F/07	25	14.0	4.1	15
5382H/08	25	14.6	4.9	15
5383F/09	25	13.2	4.6	15
5383H/10	25	13.5	5.2	15
5384F/11F	60	30.6	12.1	25
5384F/12F	60	36.1	12.4	25
5384H/13H	60	32.8	10.7	25
5384H/14H	60	36.8	11.7	25

GCSE Mathematics Grade Boundaries for 2381– June 2010

The table below gives the lowest raw marks for the award of the stated uniform marks (UMS).

Unit 1 – 5381

	A*	A	B	C	D	E	F	G
UMS (max: 55)				48	40	32	24	16
Paper 5381F				24	20	16	12	8
UMS (max: 80)	72	64	56	48	40	36		
Paper 5381H	29	25	19	13	9	7		

Unit 2 Stage 1 – 5382

	A*	A	B	C	D	E	F	G
UMS (max: 41)				36	30	24	18	12
Paper 5382F				19	15	12	9	6
UMS (max: 60)	54	48	42	36	30	27		
Paper 5382H	23	19	14	10	9	8		

Unit 2 Stage 2 – 5383

	A*	A	B	C	D	E	F	G
UMS (max: 41)				36	30	24	18	12
Paper 5383F				18	15	12	9	6
UMS (max: 60)	54	48	42	36	30	27		
Paper 5383H	22	18	14	10	6	4		

Unit 3- 5384

	A*	A	B	C	D	E	F	G
5384F_11F				44	34	24	15	6
5384F_12F				50	40	30	20	10
5384H_13H	53	43	33	24	14	9		
5384H_14H	59	48	37	27	15	9		

	A*	A	B	C	D	E	F	G
UMS (max: 139)				120	100	80	60	40
5384F				94	74	54	35	16
UMS (max: 200)	180	160	140	120	100	90		
5384H	111	91	71	51	29	18		

UMS BOUNDARIES

Maximum Uniform mark	**A***	**A**	**B**	**C**	**D**	**E**	**F**	**G**
400	360	320	280	240	200	160	120	80

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