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Principal Examiner Feedback

June 2011

GCSE Mathematics (2381)

Foundation Calculator Paper (12F)

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1. PRINCIPAL EXAMINER'S REPORT – FOUNDATION PAPER 12

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. It appeared that a number of candidates did not have access to a calculator during the exam which prevented them successfully completing some questions. Those candidates who did have access to a calculator did not always interpret answers from their calculator correctly with, for example, 4.7 being interpreted incorrectly as £4.07

1.1.4. Where monetary values were given in a mixture of pounds and pence, candidates did not always distinguish between these and therefore were unable to provide accurate answers.

1.1.5. When giving an answer as a fraction or ratio, candidates should be reminded to write down their initial fraction or ratio before they attempt to simplify their answer. Errors are frequently made when cancelling – if an error is made and the original (possibly correct) fraction or ratio cannot be seen then no marks can be awarded.

1.1.6. A high proportion of responses comprised the answer alone, with no working. Where working was shown, it was often difficult to follow as there was little or no explanation of what was being calculated.

1.2. REPORT ON INDIVIDUAL QUESTIONS

1.2.1. Question 1

The vast majority of candidates answered part (a) well although there were a significant number of candidates who added 2.35 and 80 rather than 2.35 and 0.80 there was also evidence of inaccurate addition.

Part (b) was answered very well by most candidates. The majority of candidates arrived at the correct answer and showed working out. A lot of the candidates who did not score full marks for this question had shown an understanding that you had to add two lots of £1.70 and two lots of £0.65 and thus gained a method mark. There was evidence that some candidates could not interpret a calculator display of 4.7 and gave the answer as £4.07. A significant minority added only one cup of tea and several used incorrect prices either misreading the table or the question.

Many candidates scored full marks in part (c), quite often without showing working out. A common mistake was to confuse division with multiplication and, as a result, a common incorrect answer was 13 (candidates writing 10 × 1.3). One frequently seen incorrect method was to divide 1.30 by 10, those who divided correctly sometimes then rounded their answer up to 8.

If the method was correctly shown the latter candidates scored a method mark but without working an answer alone of 8 scored no marks. Another common mistake was to write 9 after working out 7 × 1.3 = 9.1 Many candidates attempted successive addition but lost track of the number added.

1.2.2. Question 2

It was common for candidates to omit units in part (a) with 8.4 or 8.5 given as an answer. Some candidates did seem to 'miss' or not understand part (b) as the line segment was sometimes untouched, with no attempt to draw a midpoint. Those who understood the work 'midpoint' generally indicated the correct midpoint.

1.2.3. Question 3

Part (a) was well done although a common incorrect answer was 1.5, part (b) was slightly less well done with $^{7}/_{10}$ seen very frequently rather than the correct answer of $\frac{7}{100}$

Part (c) was poorly done with 3.5 or 35% seen from a significant number of candidates.

Part (d) was well answered by many candidates. A common error was to divide 210 by both 6 and 5 and then to add the results of these divisions. Some candidates attempted to turn $\frac{5}{6}$, into a percentage, but lost accuracy in rounding the recurring decimal. It was evident that despite this being a calculator paper many candidates did not use a calculator, losing marks as they made errors in division/multiplication. A 'nearly correct' answer but no working was commonly seen this was awarded no marks.

1.2.4. Question 4

Part (a) was well done. The majority of candidates were also able to give the correct response in part (b) where right-angled or scalene were accepted as answers.

Part (c) was slightly less well done although the correct triangles were identified by many candidates.

Part (d) was less well understood although many correct answers were seen.

1.2.5. Question 5

The vast majority of candidates attempted this question but disappointingly few were able to demonstrate a correct method to find 12% of 800. Common errors included using 12 or 0.12 to add or subtract giving an answer of 812, or 800 – 0.12 and other variations. Other common errors were to work out 12 × 800 or 800 ÷ 12. Many candidates used the build-up method of percentages to attempt to find 12% but a significant number of these failed to use a complete method and so lost the first method mark. Many candidates who did manage the complete method often forgot to add the amount they calculated to £800. A small minority decreased 800 by 12% getting an answer of 704.

1.2.6. Question 6

The majority of candidates were able to gain at least one mark with their response to this question. Some candidates wrote the correct formula in the working space but went on to write 8*x* on the answer line – it is clear that they believed this was the 'answer' and that their knowledge of the difference between expressions and formulae was limited. Numerical answers of 8 and 16 were fairly common with the value of x and T stated and usually the numerical value of T only on the answer line.

1.2.7. Question 7

Part (a) was well done. In part (b) a significant number of candidates employed a definite strategy, showed their methods clearly and arrived at an answer within the allowed range. The most common correct answer of 49.5 was found by directly reading from the graph at 10 metres and 5 metres then adding the two readings. A notable number of candidates were able to earn 1 mark as they employed a correct method which they showed. For example, there were many incorrect answers of 54 coming from 18 + 36 from those who were unable to read the *y* axis scale correctly. However, too many candidates simply gave an answer for part (b) which was frequently wrong; the absence of any method meant that no marks could be awarded.

1.2.8. Question 8

Part (a) was well done although it was common to see 4 given as the number of lines of symmetry of a rectangle. Part (b) was also well answered.

In part (c) the majority of candidates who failed to score full marks did so because they failed to recognise the 'whole' or that the triangles needed to be of the same size when counting. As a result $\frac{9}{4}$, $\frac{9}{13}$ and $\frac{9}{15}$ were common incorrect answers. Some candidates tried to cancel and this was done poorly except for the case where $\frac{9}{15}$ was given as the candidate's initial answer. When $\frac{3}{5}$ was seen by itself, no marks were awarded.

1.2.9. Question 9

The initial step of finding the cost of 200g of mushrooms proved too demanding for many. Most candidates had little understanding that 200g is $\frac{1}{5}$ of 1 kg. It was clear from working that a significant number of candidates did not know that there are 1000 g in 1 kg. Working out was well shown in this question and even though the cost of the mushrooms was often incorrect, candidates then realised that they had to subtract from £2.95 and divide by 3 hence earning two method marks. Many candidates who did find 64p and subtracted this from £2.95 then stopped, seemingly forgetting to divide by 3 to find the final answer. A very few candidates just found the value of 200g of mushrooms and left their answer as 64p. A significant number of candidates completed the question successfully only to lose the final mark by not giving their answer with correct units. For example answers of 0.77p, 0.77 or 77 were frequently seen. Where there are no units given on the answer line it is essential that candidates do supply these where necessary.

1.2.10. Question 10

Unsurprisingly, this question seemed to divide candidates – those happy to agree Kitty was correct usually confirmed it with the incorrect use of BIDMAS stating that she was correct because $3 \times 4 = 12$ and then $12^2 = 144$. Whereas those candidates who disagreed were divided further. Some correctly stated 'she hasn't squared first' or gave the correct answer of 48 but others made a double error by explaining that she should have done $3 \times 4 = 12$ first and then 12^2 meant you should do $12 \times 2 = 24$. There was another, smaller, group of candidates who though that the answer should be '34' squared.

1.2.11. Question 11

The majority of candidates scored at least 1 mark on this question by showing 75:50. Many then simplified the ratio incorrectly or did not simplify it enough with 15:10 given as a popular final answer. There were a number of candidates who did not use the correct notation for ratio or gave a fraction instead of a ratio. Some candidates simply wrote down an incorrect simplified ratio without first giving the unsimplified ratio and so scored no marks.

1.2.12. Question 12

Part (a) was extremely well answered with very few incorrect answers seen. Candidates were less successful in answering part (b) with 2 given as the most popular answer rather than the correct answer of 18.

Part (c) was generally well done. Incorrect answers followed either subtracting 3 from 10 and then halving or simply giving 13 as the solution.

Candidates found part (d) demanding and were frequently unable to score any marks. Common incorrect responses involved circling one or more integers on the number line or a lack of awareness of the correct use of full and empty circles. Many candidates failing to score full marks did so due to believing they needed to 'finish' the line segment at 5 with

a circle of some type rather than with an arrow (although a line segment that went as far as 5 was accepted).

1.2.13. Question 13

There were a good proportion of fully correct drawings. The sketch was done in a variety of orientations but it was easy to see that they knew what they were drawing.

Other candidates had great difficulty in deciding how to draw it at all. Those who obtained 1 mark mainly did an incomplete 3-D shape with an L shaped cross section and some extra lines drawn to begin to make their 2-D shape into a 3-D drawing. Those who just drew a cuboid gained one mark. A few attempted a 2D shape only and some left the space blank whilst others attempted a net, all these candidates scored no marks.

1.2.14. Question 14

Many candidates showed unfamiliarity with using three letters to denote an angle. Having correctly found the value of angle *ABC* in their working or writing 135^o on the diagram, they then added the sizes of the three angles *A, B* and *C* and gave a final answer of 270^o. A few students measured the angle with an angle measurer or protractor despite being told that the diagram was not accurately drawn. The geometric reason of 'Angles in a quadrilateral sum to 360^o' had to be clearly stated in some form. However, many students were inarticulate in their reason for the answer, omitting "angles" or "quadrilateral" even though their answer to the first part showed that they knew the property and could use it. Many interpreted the task as explaining how they got their answer rather than giving the geometric property used.

1.2.15. Question 15

Most candidates scored at least one method mark for calculating either 90 or 30 or demonstrating how they would get those values. Of those who arrived at 30 many just calculated $\frac{2}{3}$ of 30 and gave the answer of 20 instead of finding $\frac{1}{3}$ of 30. There were some candidates who scored as they either left the space blank or gave a jumble of incorrect figures like $\frac{3}{4}$ = 0.75 and then 120 – 75 = 45.

1.2.16. Question 16

Many candidates gained three marks for their trials but failed to appreciate the requirement to give the value of *x* to one decimal place. A common incorrect final answer was often 3.66 or similar. A number of candidates gave the correct answer but dropped a mark through not evaluating a final trial for a value of *x* to two decimal places between 3.65 and 3.7. A common incorrect method to determine whether to give 3.6 or 3.7 as an answer was to consider whether the evaluation of the expression using 3.6 or 3.7 was closest to 67. A significant number of responses showed much toil but gained no credit because of failure to evaluate the expression correctly for different values of *x* (e.g. adding 5

instead of 5*x*). Some candidates in this question failed to use trial and improvement – commonly opting for some incorrect algebraic approach.

1.2.17. Question 17

A high proportion of candidates seemed unfamiliar with Pythagoras, and attempted to find the area of the triangle, or calculate the angles. Where Pythagoras was used many candidates used it incorrectly by squaring and then adding instead of subtracting, finding the square root of 180 and thus giving an answer of 13.4 which got no marks. When the correct method was used, the final mark was sometimes lost by truncating to 10.3 with no more accurate answer being given. In this particular Pythagoras question, the correct answer could be found by an accurate scale drawing (this is rarely the case in examinations) where the correct answer was given whether or not any working was provided, full marks were awarded.

1.2.18. Question 18

This question was very badly done with the majority of candidates unable to gain any marks. $\pi \times 5^2$ – scored one mark for some candidates, with a few also working out $\pi \times 6^2$ as well. Those that did work out both did not always go on to subtract and so failed to score any further marks. Use of the formula for the circumference of a circle rather than the area of a circle was frequently seen when the question had been attempted. Common incorrect answers were $\pi \times 0.5^2$, $\pi \times 1$, $\pi \times 10$ and $\pi \times 12$. A good number of candidates left this question blank.

1.3 GRADE BOUNDARIES

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