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Examiners' Report/ Principal Examiner Feedback

November 2009

IGCSE

IGCSE Mathematics (4400)
Paper 1F Foundation Tier

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IGCSE Mathematics
Specification 4400

There was an entry of approximately 2000 candidates, 600 Foundation and 1400 Higher. This total was the virtually the same as November 2008, however the intake at the higher level was greater for this session.

The papers were again marked online and it was pleasing to note that there were very few scripts which were unreadable. Candidates have heeded previous advice and most are using black pens for writing and HB pencils for graphs.

Paper 1F

Introduction

In general, many candidates were able to make a good attempt at this paper by taking advantage of the many straightforward questions.

Report on individual questions

Question 1

Mistakes were rare, especially in the first two parts. Any fraction equivalent to $\frac{2}{6}$ was acceptable in part (a). In part (c) converting 40% to a decimal was occasionally seen and gained no credit.

Question 2

Surprisingly part (a) was the source of most wrong answers, with many candidates citing 6 as a multiple of 12. All other parts were answered well.

Question 3

The markings on the sides of the quadrilateral convinced some candidates that the word isosceles had to appear somewhere in the description of the shape. Some tried to measure the angle in part (b) and state its size. Stating that the kite had two lines of symmetry rather than one was the most common error in part (c). A variety of ways of confirming the scale factor was 2 was accepted including "times 2", "2 x", "twice" etc.

Question 4

All aspects of the bar chart were answered well. Generous allowances in parts (b) and (d) ensured most candidates scored full marks. In the latter case bars had to be over £12.50 and under £15. In part (e) if candidates increased £12 by 70%, full credit was given if £8.40 was seen in the body of the script. In rare cases (at this level) if candidates jumped straight to £20.40 from 12 x 1.7(0) the method mark was awarded but not the accuracy mark.

Question 5

The choice of an answer other than "radius" was extremely rare. In part (ii) "segment" was the most common wrong answer.

Question 6

Inputting two positive integers into an algebraic expression reduced the risk of mistakes and candidates usually gained both marks available for this question.

Question 7

The recognition of 2.5 as the mode caused very few problems. In part (b) some picked 2.9 as the median (the mean of 3.3 and 2.5). The remaining parts of this question was generally well answered. In part (d ii) a numerical digit was expected for the answer, however "zero" was accepted but not "none", or "impossible".

Question 8

Part (b) was the main source of lost marks, with many candidates dividing (or multiplying) by 100, to convert from grams to kilograms.

Question 9

Counting the cubes that made up the prism was the expected method to be employed, however many chose to try and apply a formula. This was usually 3x3x2 (=18) which scored no marks. A B1 mark was awarded for a nearly correct answer of 9 cm^3 but this was taken away if it were derived from 3 x 3.

Question 10

Both decimal answers were usually obtained correctly in parts (a) and (b). Marks were lost in the rounding process. Truncation to 61.4 was penalized in part (a ii). A surprising number failed to deal with the request for 2 decimal places in part (b ii) and shifted the decimal point two places to the right to get 8455.76 or two places to the left to get (0).0845576. Others gave 8.4 or 8.5 (both 2 digits).

Question 11

In part (a ii) 160 came up regularly, (from 3 x 55 – 5). Merely substituting 55 into an "algebraic expression" in the correct place (i.e. 55 = 3 x "n" – 5) was enough to gain the method mark. In part (b) if 5 as the next term was reached then 6.2 naturally followed. Some possibly knew they had to add 1 on somewhere to 4.0 but ended up writing 4.1 and then 4.12.

Question 12

In part (a) misquoting the units was usually the only source of dropped marks, cm^2 were the most common wrong units but even this was comparatively rare. Part (b) was well answered.

Question 13

Whilst a majority of candidates gained the correct answer of £8 a significant minority misinterpreted the wording of the question. The most common mistake was to assume the £1.50 was an extra charge on top of the £5, hence additional time was to be charged at £6.50 an hour. This led to a total charge of £18 (£5 + 2 x £6.50). Others assumed that £5 was a stand-alone non-refundable deposit and were charge £1.50 per hour. This led to an answer of £9.50 (£5 + 3 x £1.50). For both these cases 1 mark was awarded and treated as special cases.
Similar misinterpretations occurred in part (b). Many able candidates failed to add on the first hour after correctly obtaining 7 hours from (£15.50 - £5.50) ÷ 1.50.

Question 14

Most candidates obtained the 2 marks economically by showing the 2 and 4 cancelled or by multiply out the numerator and denominator to obtain $\frac{2}{12}$. If cancelling was not used any fraction equivalent to $\frac{1}{6}$ was sufficient and some gained this by (unnecessarily) converting to $\frac{8}{12}$ and $\frac{3}{12}$ before multiplying to get $\frac{24}{144}$.

In part (b) weaker candidates offered products of (2 x 5), (1 x 3) and (3 x 5) without indicating whether these were to form parts of the numerator or denominator. $\frac{10}{15}+\frac{3}{15}=\frac{13}{15}$ was seen in most cases and scored full marks.

Question 15

In rare cases 7 + 5 rather than 7 x 5 was seen in part (a). Most candidates jumped straight to
$3y = 12$, in part (b) and this was sufficient to justify they had used an algebraic method to obtain the correct answer. Numerical treatments to get the correct answer were fairly rare even at foundation level and most candidates attempted an algebraic approach.

Question 16

Part (a) was especially challenging at foundation level. Common wrong responses included the assumption that the given triangle was equilateral and hence $x = 60^o$. The most successful and economical method was to find the exterior angle of 45^o and work on the supplementary angle from there. Common mistakes in part (b) was to divide 180^o by 30 or to wrongly assume that part (b) was linked to part (a), ignoring the given 30^o, and dividing 8 into 360^o.

Question 17

Most candidates were untroubled by gaining a decimal answer (3.75) as the mean number of people in each family. For those that did round up to 4, or even down to 3, full marks were awarded as long as 3.75 was seen beforehand by a legitimate method.

Question 18

Candidates were not specifically asked to form and solve an equation in part (b) and hence numerical approaches were given credit. Separate B1 marks were given in part (a) for $12x$ and $6(x+2)$. These did not have to be gathered up and/or simplified but efforts to do this were penalized by 1 mark if they led to a wrong final expression.

Question 19

The concept of intersection was understood more than union and hence part (a)(i) performed better than part (b). Many candidates wrote out the elements of S union V rather than say how many elements belonged to this set. Only 1 mark was available, and the answer was wrong, so the mark was lost in this case. In part (c) a simple statement of "Black Cats" or "Cats which are Black" was required rather than replacing the intersection symbol with the word "and". Writing "Cats and Black animals" was therefore deemed insufficient.

Question 20

Pythagoras is a common topic which is regularly tested and this particular example involving 2 shorter sides with integer values caused no significant problems other than premature rounding to 7.2 where a final answer rounding to 7.21 was required.

Question 21

In part (a) most candidates applied the given formula correctly and used the π button on their calculator. Decimal approximations of 3.14 or better or $\frac{22}{7}$ were accepted as these led to answers rounding to 188 or 189 cm.

In part (b) better candidates were able to retain accuracy and produce a final answer rounding to 3.78 or 3.79. Premature rounding again cost some candidates the final accuracy mark. At foundation level there was occasional confusion which led to some candidates subtracting a circumference away from an area of a square. In these cases only the first method mark was awarded for the area of the square.

Question 22

This question enables most candidates to gain full marks. The only mistake, which intermittently occurred, was to see the last four rows in the table added.

Question 23

In part (a) the correct expansion of the expression was performed by most candidates. Three of the four terms needed to be correct to gain the first method mark. Some errors did arise from collecting the terms notably on the constant term. Equations which are given and require at least a two step application require an algebraic process and therefore answers only, or a trial and error approach or a purely numerical approach in part (b) gained no credit. Here x – 5 = 3 x9 or x – 5 = 27 would have satisfied the condition of an algebraic process.

The inequality in part (c) posed no significant problems.

Question 24

Correct final answers were rare here but most candidates could pick up the first method mark by correctly calculating the area of any one face. Errors in the second stage of calculating all areas of the faces correctly, together with an intention to add, tripped all but the most able. Some candidates calculated attempted to calculate the volume whilst the very weakest added all four values seen together. This latter figure came to 60, coincidentally the area of the triangular face, but of course gained no credit.

Statistics

Overall Subject Grade Boundaries – Foundation Tier

Grade	Max. Mark	C	D	E	F	G	U
Overall subject grade boundaries	100	73	57	42	27	12	0

Paper 1F – Foundation Tier

Grade	Max. Mark	C	D	E	F	G	U
Paper 1F grade boundaries	100	72	57	42	27	12	0

Paper 2F – Foundation Tier

Grade	Max. Mark	C	D	E	F	G	U
Paper 2F grade boundaries	100	73	57	42	27	12	0

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