Examiners' Report/ Principal Examiner Feedback

Summer 2010

IGCSE

IGCSE Mathematics (4400) Paper 2F Foundation Tier

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There was an entry of just over 29,500 candidates, 2,500 more than a year ago. This comprised 19,000 from the UK and 10,500 from overseas. The Foundation tier entry actually declined slightly but this was more than compensated for by a 10% increase in the Higher tier entry.

All papers proved to be accessible, giving candidates the opportunity to show what they knew, an opportunity taken by the majority of them.

Paper 2F

Introduction

There was much evidence of good basic skills , especially early in the paper with questions involving numerical calculations. Most candidates performed well where a topic had been regularly tested in the past, such as averages, angles in shapes, probability scales etc. Elsewhere some limitations were exposed, specifically in algebra-based topics or recounting geometric facts. Better candidates were able to break down the longer questions, found towards the end of the paper, effectively to gain marks.

Report on individual questions

Question 1

The pictogram was easy to interpret and gave the majority of candidates an early opportunity to gain marks. There were a few instances where interpreting that 2½ houses were drawn for part (d) required some judgement on behalf of the marker. A quite common mistake was to draw a roof and half a house that represented three houses rather than two.
Weaker candidates sometimes drew ten houses.

Question 2

This question generally scored well, though it was clear in a small number of cases candidates did not understand the term ‘factor’ in part (a)(ii). Errors were relatively rare for this part, but of the errors, an answer of ‘8’ was the most common mistake.

Question 3

Some weaker candidates fell into the obvious trap of stating that James bought 4.47.. games, and then did not round down to 4. In extreme cases, this was carried forward in to part (b), where it was calculated that James would receive less than a penny change if he bought this decimal number of games.

Question 4

Most pinpointed the correct position for A and B on the probability scale. There was a fair degree of tolerance allowed for the position of C. This point had to be marked to the right of zero and be less than the midpoint between 0 and 0.5.

Question 5

Parts (a) and (b) scored well, though very occasionally, some put the x and y value the wrong way round. Various spellings of quadrilateral or trapezium were common mistakes in part (c). Part (d) did not score well. Many candidates assumed the parallelogram had one or two lines of symmetry. The angle in part (e) allowed a tolerance of $\pm 2^\circ$ from 56°. The most common answer was 57°.

Question 6

If conceptual differences between mode, median and mean were understood, candidates scored well. Marks were lost in part b) by not placing the numbers in order before extracting the median. Putting the range in (c) as two numbers, i.e. 142 to 159 or 159-142 etc lost one mark. There was some evidence of random guessing in part (e) from weaker students, though the correct answer of A was offered far more than other answers.

Question 7

Part (a) did not score that well. In (a)(i) Shape C was a common wrong answer. Many were unfamiliar with the term congruent and the fact that shape E had been rotated compounded the problem. Part (a)(ii) fared a little better, but candidates often picked shapes C or F in lieu of shape D as both C and F looked bigger than shape B.

In part (b), most candidates correctly spotted that three was the scale factor of the enlargement, but finding the centre of enlargement was a more challenging exercise.

Question 8

Candidates were not penalised by adding a numeric value to their measurement selection i.e. length of an aeroplane = 50 metres. Apart from selecting an inappropriate metric unit, some candidates did not score by choosing imperial units, especially for length.

Question 9

Most candidates could use their calculators effectively to work out squares and square roots. Rounding off errors caused some to lose marks in part (c)(ii) with 2.80 and 2.8 common wrong answers.

Question 10

A small minority of candidates thought angles in a triangle = 360º. They failed to notice that this led to a reflex angle for *x*, however they could still pick up a follow through mark in part (b) for recognising vertically opposite angles.

Question 11

This question rather polarised answers in that able candidates wrote down concisely the correct answers in both cases and weaker candidates wrote unrelated, often numeric expressions, (usually co-ordinates of points on the lines). Of the two parts, line A scored better than line B. Some mixed up x = -2 with y = -2 for line B.

Question 12

The multi-stage format of this question caused problems for weaker candidates, together with a lack of understanding of the concept of 'profit'. Many incorporate 8 x $2.50 (the cookies to be given away) into their final calculations. Despite this, most were able to pick up 3 marks at least, for calculating the $125 spent on buying the cookies, and the $120 and $36 for selling them.

Question 13

In part (a) the answer 4 was allowed to be stated with no working shown as this represented a one-stage process. In part b) an algebraic process needed to be demonstrated by either 4x = 17.5 or 4x=12 or a flowchart method in order to gain the marks. Correct answers with no working, or trial and error, or a numerical process (i.e. (17-5) ÷ 4) gained no marks.

In part (c) the complexity of the equation encouraged an algebraic approach. It was a pity many good attempts were penalised by one mark through candidates truncating their answer to 5.3 (1d p) without showing 16/3 or 5 1/3 or a more accurate decimal beforehand, in the body of the script.

Question 14

Both parts (a) and (b) proved challenging questions for many candidates.

In part (a) candidates were expected to measure the required angle within a tolerance of ±2°. Full marks were gained for answers in the range 248° to 252° inclusive. A common wrong answer was 110°.

Part (b) was even less well done. An exact answer of 230° was required from a calculation. Many candidates offered 310° (from 360° - 50°), or 130 (from 180° - 50°) and scored no marks for this. A diagram produced by candidates sometimes showed the correct approximate position of C but from there many were unsure which angle to take as the correct answer. A significant number of candidates did not attempt this part of the question.

Students scored most marks on part (c). A tolerance of ± 0.2cm was allowed in measuring the distance from town A to B. A relatively easy conversion scale usually secured full marks here.

Question 15

Parts (a) and (b) provided no significant hurdle for a majority of candidates though in isolated cases some left the answer to part (a) as -12 + 14. The most common wrong answer to part (b) was 225 (from 15^2).

Question 16

Both parts (a) and (b) scored well in this straightforward probability question.

The occasional miscalculation in choosing the expected number of red, rather than blue, beads giving 0.5 x 30 =15 was not taken as a misread, and gained no marks.

Question 17

In part (a), the conversion of 1 hour 15 minutes to hours was the main source of errors. Credit was given (M1) for dividing by 1.15 or 75 (minutes) in lieu of 1.25, (but not 1.4 or other values) as this showed some recognition of an attempt to divide a distance by a time.

Parts (b) and (c) posed no real difficulties for better candidates. In the latter case most opted for a longer method of finding 15% of £12 (£1.80) before subtracting this from £12.

Question 18

Better candidates coped well with this question and immediately recognised a standard Pythagoras method for finding the longest side. Weaker candidates gained no marks for multiplying the square numbers together or lost marks by forgetting to square root the sum of the squares.

Question 19

Part (a)(ii) scored well by a majority of candidates but all parts after this fared much worse.

In (a)(ii) many candidates wrote down the members of the set $A \cup B$ rather than state how many members were in this set. In other cases candidates followed a false lead from (a)(i) and wrote down 2.

Part (b) challenged most. Candidates regularly forgot that P and Q had to have 3 members each, and both had to contain the members 3 and 4.

Question 20

This question provided a good discriminator test between those looking to secure the top grade and those not so strong. For the latter, the amount of detail given in the question, regarding the tile size and the large rectangle, put many of the weakest students off even making a start on this question.

In part (a) a correct equation was required to be established based on perimeter or semi-perimeter, (typically 7(x+1) +3(5x-2) =34 or equivalent). Marks were not deducted if wrong algebra followed from this, as mistakes were likely to be penalised later in part (b). The most common mistake was to sum only two sides together and make this equal to 68. If correct algebra followed from this the candidate would reach 22x=67, rather than 22x=33 or 44x=68, and would then gain 4 of the 6 marks available.

Question 21

This question exposed some limitations like the one before. If candidates could establish the first step of converting the mixed fractions on the left hand side to improper fractions, they gained the first method mark, and were then on the journey to gaining more marks.

Of those candidates who gained more than one mark, most chose the conventional method of converting from mixed to improper fractions and then inverting the second fraction before showing an intention to multiply. The final mark out of the three was dependent upon the preceding calculation. For example 3/2 x 4/5 = 12/10 would gain B3 whilst 3/2 x 4/5 = 6/5 would only gain B2 unless clear evidence was shown that cancelling had taken place.
For dividing methods the final mark was again dependent on the preceding calculation; 6/4 ÷ 5/4 =6/5 and 12/8 ÷ 10/8 = 12/10 would both gain B3 but 12/8 ÷ 10/8 = 6/5 would only gain B2.

Decimal treatments were ignored and gained no credit for that stage.

Question 22

Correct answers of 12.5% were seen by the better candidates, but a significant number chose to divide the difference (1.75m) by the finishing figure (15.75m) instead of the starting value (14m). This yielded a percentage increase of 11.1%. Candidates gained two of the three marks in these cases.

Statistics

Overall Subject Grade Boundaries – Foundation Tier

Grade	Max. Mark	C	D	E	F	G	U
Overall subject grade boundaries	100	71	56	41	26	11	0

Paper 1F – Foundation Tier

Grade	Max. Mark	C	D	E	F	G	U
Paper 1F grade boundaries	100	71	56	41	26	11	0

Paper 2F – Foundation Tier

Grade	Max. Mark	C	D	E	F	G	U
Paper 2F grade boundaries	100	71	55	40	25	10	0

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