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Mathematics – Foundation (4400)

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Examiners' Report

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IGCSE Mathematics 4400
Paper 1F

The candidates (almost 1100, 75% of them Higher tier) found the demands of all four papers reasonable and took the opportunity to show what they knew. Many questions had a high success rate and very few candidates were entered for Higher tier when Foundation would have been more appropriate. Working was generally well presented and methods clearly shown.

Introduction

All questions proved to be accessible and a substantial number of candidates scored high marks, many of them well above the grade C threshold.

Report on Individual Questions

Question 1

Most candidates achieved success on this straightforward starter question and full marks were common. The factor in part (a) was a larger number than usual, which reduced the success rate but, if marks were lost in part (a), it was probably in part (iii) (square number) or part (iv) (prime number), 8 being the most popular wrong answer for both parts. Errors were rare in parts (b) and (c).

Question 2

The second part was usually correct but, in the first part, "likely" and "impossible" appeared frequently.

Question 3

This was very well answered, the majority of candidates scoring full marks.

Question 4

Parts (a) and (b) were often correct, although occasionally the coordinates were reversed or "rhombus" given as the name of the quadrilateral. In part (c), many candidates found the area of the trapezium correctly either by square counting or by using the formula, areas in the range 17 cm^2 - 19 cm^2 being accepted if the former method were used. The latter method was more likely to be unsuccessful, either through the substitution of an incorrect value or through incorrect use of the formula, $\frac{1}{2} \times 2 + 7 \times 4$, for example, resulting in an answer of 29 cm^2.

Question 5

The second part was almost always correct but there were frequent errors in the other two parts. In both cases, 1 was a very popular wrong answer and a sizeable minority did not appreciate that the order of rotational symmetry was a number, answers such as *ABC* and 180° not being uncommon.

Question 6

The mode was usually correct but a few candidates failed to put the numbers in order before finding the median, leading to an answer of 158. Others confused median and mean and some did not appreciate that the range is a single number, giving answers like 143-158. Overall, though, statistical averages were well understood. So also was probability, although answers such as "likely" and "possible" appeared occasionally.

Question 7

Part (a) was almost always correct but, in part (b), for no obvious reason, a large number of candidates gave as their answer the number, instead of the fraction, of books which are not fiction. Part (c) was well answered but it was not unusual to see $\frac{1}{3}$ expressed as 0.3 or 0.33, which led to an inaccurate answer and received no credit. In part (d), some candidates found 5% of 5400 correctly but then failed to add it to 5400. A variety of strategies was used in part (e), some of which were difficult to follow. The most common error was to treat the times as decimals and work out, for example, 08.45 + 06.30 + 0.45.

Question 8

Many candidates gained full marks on this question. Those who did not often made a slip when finding the last part by a "counting down" method.

Question 9

This was another very well answered question. The only errors which occurred with any regularity were just adding the length and the width in part (a) and omitting the units in part (b).

Question 10

Part (a) was seldom wrong and, while many candidates answered part (b) correctly, incorrect pairs of parallelograms, especially *A* and *E* and *C* and *E*, appeared often enough to be noticed.

Question 11

There was wide variation in the quality of candidates' algebra. While strong candidates successfully solved both equations, weaker ones "simplified" the first one to $6x = 11$ and the second one to $7y = 13$.

Question 12

Part (a) proved quite demanding but still had a reasonable success rate. A substantial number of candidates tried to use the laws of indices which led to the regular appearance of 15^9 and 8^{18}. Many used their calculators correctly in part (a) to obtain 0.8 but some failed to convert it to a fraction in its lowest terms.

Question 13

Knowledge of bearings varied considerably. Many gave 70°, the acute angle between the lines, as the answer to the first part. Only a minority of candidates were able to find the second bearing, 134° (360° − 226°) appearing more often than the correct answer. No credit was given for answers such as 45° and 47° obtained by drawing as the instructions were to **work out** the bearing. Omission of the leading zero in the bearing was not penalised.

Question 14

Many Foundation candidates find constructing equations even more difficult than solving them and only a minority were able to make a meaningful attempt. In part (a), the expression for the width ($6x$) was far more likely to be correct than that for the length, which was often given as $4x + 7$ instead of $4(x + 7)$.

Question 15

There were many correct solutions. Most showed intermediate results in their working, which gave them the chance of receiving credit even when the final answer was wrong. A consistent error was with the selling price of each cake on Tuesday, 0.8 or 3.8 (4 − 0.2) sometimes being used instead of 3.2 (4 − 0.8). Some had problems dealing with the unsold cakes.

Question 16

Both parts proved to be quite demanding but had fair success rates. The only wrong answer which appeared frequently enough to be significant was $\frac{1}{5}$ for part (b), the denominator being the number of classes in the school. The probability was usually given as a fraction but decimals and percentages (correct to at least 2 significant figures) were, of course, accepted.

Question 17

Many started by subtracting 48 from 60. Some went on to use 12 correctly; others either gave it as their answer or went down a variety of wrong roads. An answer of 80% $\left(\frac{48}{60}\times 100\right)$ scored 2 marks out of 3. Other answers which appeared with varying regularity were 25%, resulting from $\frac{60}{48}\times 100 = 125$, 28.8% $\left(\frac{60}{100}\times 48\right)$, 7.2 $\left(\frac{60\times 12}{100}\right)$ and 5 $\left(\frac{60}{12}\right)$.

Question 18

Many Foundation candidates find ratio difficult and there was widespread uncertainty as to what type of ratio question it was. Consequently, many shared £240 in the ratio 2 : 5 and gave the answer as £171.43. Other regular wrong answers were £560 $\left(240\times\frac{7}{5}\right)$ and £96, the amount of money that Rajesh receives. (This scored 1 mark.)

Question 19

Good candidates were able to simplify the inequality to $4x < 6$. Some gained no further credit as they left this as their solution or wrote $1\frac{1}{2}$ or $x = 1\frac{1}{2}$ as the answer instead of $x < 1\frac{1}{2}$.

Question 20

Many found the probability (0.1) that Danielle will win the race. Some gave this as their final answer but a substantial number went on to use it correctly and gain full marks.

Question 21

Only the strongest candidates achieved significant success on both parts of this question. In part (a), some realised that Pythagoras' theorem was required but used it incorrectly, starting with $AM^2 = 5^2 + 13^2$. Others used an accurate drawing, for which they received no credit, as the instruction in the question was "Work out".

In part (b), errors were often made in calculating the area of a triangle, either failing to divide by 2 or using 13 cm as the "height". It was also not uncommon for the perimeter of the base to be found instead of its area.

IGCSE Mathematics 4400
Paper 2F

Introduction

Most candidates were able to display a reasonable level of mathematical understanding and skills. A few gained very high marks, showing a high standard of competence in the topics on this paper. A few candidates were unable to tackle any but the most elementary questions.

Many candidates threw away marks by premature rounding.

Many candidates lost marks because they omitted to show working. It should be emphasised that if an answer is incorrect, some marks can still be gained, but only if working is shown.

Algebraic skills were generally somewhat weak, especially in Q10. However, a few centres found the algebraic work easier than the geometrical or statistical topics.

Report on Individual Questions

Question 1

Most candidates answered all parts of this question correctly, although some omitted one or two of the factors of 35 (usually 1 and/or 35) in part (d).

Question 2

Again, many candidates were successful. A common pair of wrong answers was (i) Certain (ii) Likely. Perhaps there was confusion of "more than 1" with "at least 1". The word "likely" was not understood by many candidates.

Question 3

Many candidates multiplied 2 x 3 x 4, ignoring the actual shape of the solid. Many gave incorrect or no units.

Question 4

This question was generally well answered. Some candidates interpreted "range" to mean "total". A few confused one statistic with another.

Question 5

(a) Although "Cuboid", was the expected answer, "Prism" and "Rectangular prism" were accepted. "Rectangle" was a common incorrect response, as was "Cube".
(b) This part was usually answered correctly.
(c) Many candidates did not understand how to find a volume. Some added the dimensions. Others multiplied only two dimensions. In part (ii) many divided by 100 to change to litres.

Question 6

(a) Some candidates just gave the fraction, $^1/_4$. Others found the number of male players. Some candidates wrote $^1/_4$ x 72 or $^3/_4$ x 72, gaining a method mark, but then evaluated this expression incorrectly.

(b) Many candidates did not understand the expression "What fraction of . . ." Some found 72/30. Others gave 30/72 correctly but made errors in simplifying this fraction.

(c) This question was answered more successfully than similar ones in the past. A few candidates made errors when attempting to add 4: 40 to 10:30. A few gave the answer as 3:10 pm.

(d) Almost all candidates answered this question correctly. Many gave more information than was necessary. An acceptable answer was a plain "no" together with either "£25/£0.85 = 29(.4…) which is less than 30" or "30 x £0.85 = £25.50 which is more than £25".

Question 7

(a) This part was well answered. A few candidates drew four complete squares, not using common sides for adjacent squares. A few others omitted the diagonals.

(b) Many candidates drew the 6th pattern and counted sticks, not always successfully. Some used the sequence but made errors such as adding 5 or 3 each time instead of 4. A common method was to count the number of sticks in diagram 4 (often obtaining an incorrect answer of 16) and then adding either 3 or 4 to this, giving 19 or 20.

Question 8

(a) Almost all candidates scored the mark for this part.

(b) Most candidates marked *S* correctly. A few placed it at either (3, 4) or (5, 3).

(c) Most candidates used the incorrect method of *QR* x *QP*. A few counted squares, with varying success. Very few found areas of triangle by the formula.

(d) This part was well answered on the whole. Some candidates reflected in $x = 5.5$, others in $y = 5$. A few candidates did not understand the concept of reflection and gave a translation or a distorted shape of some kind.

Question 9

Both parts of this question were well answered. A few candidates gave the answer 3.1 in (a).

Question 10

Responses to this question were disappointing. Most candidates did not appreciate the order of precedence of the two operations.

(a) 5 + 3 x 2 = 16 was common.

(b) 35 = 8*t*, *t* = 35/8 = 4.375 was common. A few candidates used 35 as the term number.

Question 11

(a) This part was answered well.

(b) Most candidates gave the correct numerator. Some gave 5 or 11 as the denominator. A few lost a mark by giving the probability as a ratio.

(c) This part was not well understood. Following a correct answer of $^2/_6$ in (b), many candidates gave an answer of $^{60}/_{180}$ or 60. Some gave the answer $^{10}/_{30}$, which gained only one mark.

Question 12

Parts (a), (b) and (c) were answered correctly by most candidates. A few gave 3 in (b) or 1 in (c).

(d) Some candidates expanded the bracket correctly and found the correct answer. Many, however, failed to multiply the 4 by 3. Many also used Trial and Improvement, often successfully. Some gave a correct statement: $3(5 + 4) = 27$, but then either gave no answer or gave an answer of 9.

Question 13

Although many candidates answered parts (a) and (b) correctly, many others were confused as to whether to multiply or divide by 1.8.

(c) The most common response was 1.80. A few candidates found 1/1.8, but failed to multiply by 100.

Question 14

The correct answer was often seen. However, many candidates invented interesting methods for multiplying fractions, such as "cross-multiplying" or adding the numerators and adding the denominators. Some resorted to decimals. Most calculators are capable of multiplying fractions and giving the simplest form of the answer, but it seemed probably that even those candidates who possessed such calculators were unsure of how to use them.

Question 15

Many candidates found the correct value of p, but few could give their reasons using the correct vocabulary. Some gave incorrect reasons such as "opposite angles". "Angles on a straight line" was often quoted, but referring to pairs such as *BAD* and *ABD*. "Isosceles triangle" was sometimes seen, but "corresponding angles" hardly ever. Some candidates gave an inadequate reason such as "parallel lines" or "F angles". Some gave "alternate angles" without linking this to "vertically opposite angles". Some wrote a long description of their method, but omitted the required vocabulary.

Some candidates gave $p = 38^{o}$, sometimes stating that triangle *ABD* was equilateral.

Question 16

(a) Many candidates clearly did not understand the term "factorise". Answers such as $3(x^2 – 2)$ and $3\ x\ x\ x – 2\ x\ x$ were common.

(b) A common error was $y^4 – 4y$. Some candidates obtained the correct answer but followed it with incorrect "simplification".

(c) Many candidates started with an incorrect attempt to rearrange the formula. Others started correctly with $30 = 5 + 10t$, but most of these continued with $30 = 15t$ and $t = 2$.

Question 17

(a) Most candidates answered this successfully, although a few lost the mark by writing "$x = 4x$". Some wrote x^4.

(b) Many candidates did not understand what was meant by "form an equation in x." Others wrote equations such as $4x - 6 = x$. A few appeared to have done some mental arithmetic using common sense rather than algebra, and wrote equations such as $x + 6 = 10$.

(c) Most candidates had no sensible equation to solve. Those who did have such an equation could usually solve it correctly. A few started afresh from the context, often successfully.

Question 18

This question was well answered by some candidates. Very few candidate used unnecessarily long methods involving Pythagoras' theorem. In (a) some candidates obtained $\sin x = 0.5$ but could not proceed. In (b) some found $12/\cos 32^0$ and others $12\sin 32^0$. A large number of candidates showed no familiarity with trigonometry.

Question 19

(a) This question was not well understood, with many answers appearing to be guesses.

(b) Many candidates listed some numbers here. Some gave an (incorrect) answer of 0. A few correct answers were seen, although there was some confusion between union and intersection. Some candidates stated that 10 is not a multiple of 3, and hence is in $P \cup Q$. Some candidates did not understand the $\in$ notation.

Question 20

Parts (a) and (b) were well answered by many candidates. Perhaps the most common error was in (b) $2 + 3 \div 4$. Many candidates omitted (c) or gave $2 + 3 \div 4$.

Question 21

(a) Most candidates gave two 5's but not all found the third number correctly. Some correctly started with two 5's and worked out the third number to be 8, but wrote only 8 on the answer line.

(b) Most candidates included two 7's, but few found the other two numbers correctly. Common wrong answers were (7, 7, 5, 5), (7, 7, 6, 5) and (7, 7, 7, 7).

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