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Principal Examiner Feedback

Summer 2010

GCSE

GCSE Mathematics (1380)

Foundation Non-Calculator Paper (1F)

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1. PRINCIPAL EXAMINER'S REPORT – FOUNDATION PAPER 1

1.1. GENERAL COMMENTS

1.1.1. This paper seemed to give the opportunity for candidates of all abilities to demonstrate positive achievement.

1.1.2. Candidates appeared not to have been limited by a lack of access to mathematical equipment though there was some evidence that they did not always take advantage of the availability of tracing paper.

1.1.3. Many candidates showed less understanding of "shape and space" than of other areas of the specification.

1.2. REPORT ON INDIVIDUAL QUESTIONS

1.2.1. Question 1

Nearly all candidates gave the correct responses to all three parts of this question. The most frequent error was for candidates to draw a bar for a frequency of 9 in part (c).

1.2.2. Question 2

This question was also well answered. Parts (a), (b) and (c) were answered correctly by 87%, 90% and 88% of candidates respectively. In part (b) the most common error was to give the response "thirty thousand and twenty". In part (c) answers of 8000, 200 and 8100 were given by some candidates. Fewer candidates were successful in part (d). The success rate here was 81%.

1.2.3. Question 3

91% of candidates were able to measure the length of PQ, giving an answer within the tolerance (± 2mm) allowed. A small number of candidates rounded the length to the nearest cm. Part (b) was less well answered with a 64% success rate. A significant proportion of candidates gave 145 as their response to this part of the question. Most candidates showed the clear intent to identify the type of angle as "acute" in part (c). Incorrect responses included "obtuse", "right" and "left".

1.2.4. Question 4

Part (a) was very well done. 92% of candidates got this correct. The success rate was much lower for part (b) with only 57% of candidates able to give a completely correct list. Many candidates put 0·06, 0·35, 0·56 and 0·63 in the correct order but were unable to place 0.3 in the right position. Weaker candidates were often successful when they wrote 0·3 as 0·30.

1.2.5. Question 5

84% of candidates were able to give a complete and correct list of combinations. As you would expect, candidates who set about the question in a logical fashion just changing one variable at a time were most successful. Candidates who were more random in their approach often missed one or more combinations out. Repeated combinations were not penalised.

1.2.6. Question 6

Nearly all candidates were able to draw the next pattern in the sequence and to complete the cells in the table associated with pattern 4 and pattern 5. Most candidates were able to give a correct response to (c) but arithmetic errors prevented a significant minority of candidates gaining the mark here. The incorrect response "26" was often seen. Whilst some candidates gave very lucid accounts of a method they could use to find the number of sticks in pattern number 100, many others gave incomplete accounts. However, though not required, it was encouraging to see candidates able to find an algebraic expression for the nth term in the sequence. Many candidates said you could find the number of sticks in pattern number 10 and multiply the answer by 10.

1.2.7. Question 7

All parts of this question were well answered. The most common error was from candidates who identified 20 as a square number in part (c). In part (d) many candidates suggested 4 was a factor of 42. Correct answers to the parts of this question were given by 94%, 98 %, 71%, and 77% of candidates respectively.

1.2.8. Question 8

Though a sizeable number of candidates gave the perimeter (16cm) as their response to part (a) and the area (15) as their response to part (b), this seemed to appear less frequently than in previous examination series. Many candidates did not respond to the demand "state the units of your answer" and so lost a mark unnecessarily. Just under a half of candidates gained full marks in this question.

1.2.9. Question 9

The first three parts of this question were answered very well with 98%, 99% and 98% success rates. Some candidates found the total cost of one packet of Coco Pops and one packet of Shreddies in part (d) and there were many arithmetic errors. Candidates who set their addition out in a column seemed most successful. 70% of candidates obtained full marks.

1.2.10. Question 10

93% of candidates wrote down the correct coordinates of point P. Part (b) was also well answered. Incorrect responses mainly consisted of candidates plotting points at (2, 1) instead of (1, 2) and/or (-2, -3) instead of (-3, -2).

1.2.11. Question 11

Nearly all candidates gave the correct response in part (i). A drawing of a square was accepted. Part (ii) was answered quite well with 69% of candidates scoring full marks. However there continues to be a large number of candidates using unacceptable notation to give probabilities - for example "5 in 9", "5 out of 9" or "5:9". The first two of these responses could be given partial credit but the third one could not be awarded any marks as it implies a probability of $\frac{5}{14}$. Other common responses included $\frac{4}{9}$, awarded 1 mark and various values greater than 1 which could not be given any credit.

1.2.12. Question 12

Less candidates appeared to be confused between mean, mode, median and range than in previous examination sessions though there were still some candidates who gave one of the averages as their response to part (b). Other errors included giving 15 (highest number) as the mode and 4 as the median (the middle number in the unordered list). The mode was identified correctly by about three quarters of the candidates, the range by just over a half and the median by three in every five candidates.

1.2.13. Question 13

Nearly all candidates identified the type of book associated with the smallest percentage and most candidates were able to express 13% as a decimal. On average candidates scored about half the marks available for parts (c) and (d). Full marks were awarded to just over 30% of the candidates. In part (c) many candidates gained at least one mark for writing 24% as $\frac{24}{100}$ but fewer went on to give the correct final answer. Unfortunately a significant number of candidates thought that $\frac{6}{25}$ could be simplified further – usually to $\frac{1}{4}$ and so lost the second mark available in this part of the question. Responses to part (d) included those from candidates who correctly worked out 15% of 3000 then subtracted it from 3000 though this was seen less frequently than expected. Surprisingly, many candidates who tried to work out 5% and 10% with the intention of adding them together made simple arithmetic errors – for example by stating that 10% of 3000 is 30.

1.2.14. Question 14

Giving a counter example to show that Tanaka was wrong was enough to gain candidates two marks in this question, provided no other statement was made which was inconsistent/contradictory. 75% of candidates satisfied this criteria. Candidates who gave an example of an odd number multiplied by an even number with an incorrect evaluation of that product were awarded 1 mark.

1.2.15. Question 15

Most candidates recognized that *x* must be 38 but considerably fewer could give "opposite angles" as their reason. Often candidates were content to state "because they are the same" or an equivalent statement. Some candidates stated the angles were "corresponding". Part (b) proved to be a good discriminator and tested whether candidates could successfully complete a multi-step process and communicate the reasons to back up their calculations. Only about half of the candidates were credited with any marks. A large proportion of candidates gave 70 as their final answer, many without any working in the space provided or any evidence on the diagram. Candidates who had clearly worked out the angle PQT as 70° were awarded 1 mark for this. There is still a large number of candidates who confuse the notation for showing that two sides are equal in length with that showing that two lines are parallel to each other. Only a small number of candidates were awarded the mark for giving correct reasons.

1.2.16. Question 16

Parts (a) and (b) were answered successfully by 73% and 59% of candidates respectively. In parts (c) and (d) there were many good answers. Only about a third of candidates failed to gain any credit here. Of the candidates who did not score full marks a sizeable number made a correct substitution for *k* in part (c) but then either forgot to add the "12" or gave 24 or 32 as their answer. These candidates were awarded 1 mark. Too many candidates gave "37" as their answer to this part, presumably obtaining this from "25 + 12". In (d), evidence from working suggested that the most candidates had used either a trial and improvement method or one using reverse operations rather than writing down an equation and solving it. Those candidates who did write down an equation were often unable to solve it to obtain the correct answer. Of students who attempted a method using reverse operations many evaluated "$\frac{22-2}{4}$" rather than "$\frac{22+2}{4}$".

1.2.17. Question 17

Three quarters of candidates correctly identified the quadrilateral as a kite. Attempts at part (b) were much less successful. About 40% of candidates gained some credit, most of these being able to draw enough kites to score full marks. Unfortunately, many candidates drew several apparently randomly placed kites or even just drew a selection of different shapes on the grid. Some candidates who seemed to realise that they needed to cover the plane with kites failed to realise that this must involve inverting some kites.

1.2.18. Question 18

Well over half of all candidates scored full marks in part (a) of this question. Of those that were not successful, most converted 135 minutes to 1 hour 35 minutes and gave one of the answers 19 45 or 7 45. The more successful attempts were from candidates who converted to 12 hour clock time. However these candidates did not always include pm with their answer of "8 25" Part (b) of the question proved to be a good discriminator with many candidates able to find either $\frac{1}{6}$ or $\frac{3}{10}$ of 300 but with only the better candidates able to go on to score full marks.

1.2.19. Question 19

All three parts of this question were answered quite well with 82%, 77% and 58% obtaining the correct answers in parts (a), (b) and (c) respectively. The most common incorrect answer given in part (c) was 40 minutes.

1.2.20. Question 20

This question was not well answered. Under a half of candidates were able to multiply the two fractions in part (a) successfully. The most common answer given in part (b) was $\frac{3}{28}$ presumably obtained by adding the numerators and denominators of the two fractions. Of those candidates who successfully converted $\frac{1}{7}$ to $\frac{3}{21}$, many failed to get any further. Less than a quarter of the candidates could be awarded any marks in this part of the question.

1.2.21. Question 21

Many candidates were not well prepared to answer this question on stem and leaf diagrams. It was not attempted by a significant proportion of candidates and others made only poor attempts. In cases where candidates had an understanding of what was required they usually produced accurate, ordered diagrams. Sometimes these same candidates failed to get the mark for a correct key.

1.2.22. Question 22

It seems that many candidates did not have access to or use tracing paper to help them in this question. Only a small proportion of candidates gave fully correct answers. A further large number of candidates gained 1 mark for drawing a triangle with the correct orientation but in the wrong position. In other cases candidates had reflected or translated the triangle. Only a small number of candidates rotated the triangle by 90°.

1.2.23. Question 23

Unfortunately, many candidates tried to describe a combination of two transformations despite the clear request for a single transformation. Over half of all candidates failed to score any marks in this question. Many candidates did not use any of the language associated with enlargements but merely tried in their own way to describe what had happened to the shape - for example, "it has doubled in size". The marks available were clearly linked to a mathematical description of the transformation – i.e. enlargement (1 mark), scale factor 2 (1 mark), centre (1, 0) (1 mark). The award of 3 marks was quite rare as only a few candidates could give the correct centre of enlargement.

1.2.24. Question 24

This question was well answered by candidates across the ability range. Marks were attributed equally to all three of the aspects stated in the mark scheme. 44% of candidates gained full marks for their responses, with many more gaining one mark.

1.2.25. Question 25

This question, requiring a standard procedure, was well answered by more able candidates. Many other candidates realised that Bill should get a bigger share of the money and that the total to be shared out must add to £40, but were unable to complete the question successfully, hence answers such as £15, £25 and £10, £30 were very common. Usually candidates scored either full marks on no marks in this question.

1.2.26. Question 26

Just over 10% of candidates scored any marks in this question, showing there was little understanding of how to find the volume of this triangular prism. Many candidates merely multiplied or added the four measurements given on the diagram. A significant number of candidates realised the "5" was redundant information but they often stopped after working out "3 × 4 × 20". It was disappointing to see so few candidates go on to realise that they needed to divide their answer by two.

1.2.27. Question 27

This question was attempted by most candidates but only about a third of them could be awarded any marks. Many different methods were employed, but multiplication and place value errors spoiled many candidates' attempts. Using a grid method seemed to have been less successful than in previous examination sessions. The use of a Napier's Bones method, where the candidate did not have to think about place value in the initial stages, was more successful in terms of candidates gaining partial credit for their responses.

1.2.28. Question 28

"15*x*" was the most common answer to part (a) of this question. Only one in six candidates were able to factorise the linear expression correctly. Correct answers to parts (b) and (c) were seen rarely. In part (b) some candidates successfully expanded the brackets but very few could successfully isolate terms in *x* on one side of the equation and constant terms on the other side. Of the candidates who did obtain the correct solution some then tried unsuccessfully to convert their answer to a decimal. These candidates were awarded full marks as an answer in the form $\frac{19}{3}$ was acceptable. Part (c) of the question attracted only a very small proportion of answers worth any credit. Those candidates who did show a clear understanding of a method for expanding brackets usually went on to gain both of the available marks.

2. STATISTICS

2.1. MARK RANGES AND AWARD OF GRADE

Unit/Component	Maximum Mark	Mean Mark	Standard Deviation	% Contribution to Award
1380/1F	100	58.4	18.3	50
1380/2F	100	61.8	18.3	50
1380/3H	100	57.5	21.5	50
1380/4H	100	61.7	19.3	50

GCSE Mathematics Grade Boundaries 1380 – June 2010

	A*	A	B	C	D	E	F	G
1380_1F				75	60	45	31	17
1380_2F				78	63	48	34	20
1380_3H	89	69	49	30	18	12		
1380_4H	90	72	54	36	21	13		

	A*	A	B	C	D	E	F	G
1380F				153	123	94	65	36
1380H	176	141	103	66	39	25		

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