

Principal Examiner Feedback

November 2010

GCSE

GCSE Mathematics 2381

Higher Calculator Paper (14H)

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1. PRINCIPAL EXAMINER'S REPORT - HIGHER PAPER 14

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 Candidates are advised to make sure that their pencil marks in constructions and diagrams are clearly visible, particularly when the paper is marked online. At times it was hard to see the lines drawn in question 8.
- 1.1.4 It was encouraging to note that most candidates did try to show their working out and this led to many method marks being scored in questions 15, 16 and 18 when the answer was incorrect. However in question 5 candidates often did not show partial calculations which could have scored a mark if their answer was incorrect.

1.2 REPORT ON INDIVIDUAL QUESTIONS

1.2.1 Question 1

This proved to be a good starter question with over 80% of the candidates scoring all 4 marks. Those who did not score all 4 marks tended to lose 2 marks in (b) by working out $2 \div \frac{1}{2}$ reaching an answer of 4 people.

1.2.2 Question 2

Part (a) was generally done very well with nearly 70% of candidates scoring both marks.

Those that were incorrect tended to have no idea of how to reflect in a horizontal line. These candidates would be best advised to rotate the exam paper 45° so that the mirror line is vertical.

Over 80% of candidates scored at least 2 marks generally for a correct enlargement scale factor 3. However many failed to use the correct centre. As a result only 32% scored all 3 marks.

1.2.3 Question 3

88% of candidates scored both available marks in a variety of ways.

$8 \div 20 \times 100$ was seldom seen with various partitioning methods preferred.

1.2.4 Question 4

Part (a) was answered very well with over 90% of candidates gaining full marks. It was pleasing to note that most tried to rearrange the equation rather than use trial & improvement. There were several candidates whose 1st step was $2x = 10 + 3$ whilst others divided by 2 first.

(b) This was extremely well answered with over 91% writing c11.

(c) This part was almost as successful as part (b) with over 87% writing e8. e3 was the most common incorrect response.

1.2.5 Question 5

Although a pleasing 82% scored both marks it was noticeable that the 9% of candidates who scored no marks tended to show no working thereby not accessing a mark for 19.56 or 8.0518 seen. Any candidate with a calculator should have no difficulty scoring at least one mark on this question.

1.2.6 Question 6

This was well answered with nearly 78% scoring both marks. Only 10% failed to score. This was generally for an answer of -3, -2, -1, 0, 1

1.2.7 Question 7

Writing down expressions and a formula was very well done with 48% scoring all 3 marks. A further 33% scored 2 marks generally for parts (a) and (b). The most common incorrect response in (c) was $T = x + y$. A few made careless errors by using the letter x in both parts (a) and (b).

1.2.8 Question 8

(a) Most candidates gained full marks for drawing the front elevation. For those who did not, the errors included:

- adding an extra column or occasionally an extra row,
- adding an extra square at the top,
- drawing a 3 dimensional diagram,
- drawing from a different orientation.

(b) This was also done well. A significant number attempted to draw a net of the shape or a 3 dimensional diagram. A minority drew a rectangle of different proportions (most only one square longer or shorter but occasionally long enough to fit the whole space).

A minority of candidates transposed parts (a) and (b).

Overall, nearly 70% of candidates scored all 4 marks with a further 24% scoring 2 or 3 marks.

1.2.9 Question 9

This was well answered with 73% scoring both marks and only 14% failing to score. Common errors included incorrectly removing the bracket, subtracting 15 from 24 instead of adding, and leaving the answer embedded in the equation. Only a few candidates divided through by 3 as their 1st step. Some attempted trial and improvement methods but were usually unsuccessful.

1.2.10 Question 10

This question was tackled in a variety of ways. Many started with 14.56×10^{-16} and then either stopped or went on to write 1.456×10^{17} . Others converted the two parts to ordinary numbers and then either forgot to put their final answer back into standard form or did not convert one of the numbers correctly. Overall, 50% of the candidates scored both marks with a further 20% scoring 1 mark.

1.2.11 Question 11

Most candidates just wrote 1, 2, 3, 4 or 4, 3, 2, 1. This did not manage to score any marks! Overall, 30% scored both marks with a further 35% scoring 1 mark.

1.2.12 Question 12

It was really pleasing to see how candidates attempted this question with only 12% of candidates failing to score. Many did the calculations correctly but then did not write any explanation or sufficiently explain why only 92 cups could be filled. As a result 29% of candidates scored 2 marks. There were some errors in converting between ml and litres in about 10% of the responses. Nearly half the candidates got this question fully correct.

1.2.13 Question 13

A majority of candidates completed the table correctly. (-2, -15) was the most likely point to be incorrect. Some chose points to make the graph fit a straight line after joining (3, 20) and (-1, -8)! A few candidates made errors on the table, then clearly realised their mistake while drawing the graph, but did not alter their error on the table.

A significant number of candidates joined their points with a ruler losing a mark in (b) and a few did not join the points at all. Other candidates clearly used a scale of 1 mm = 1 unit for y.

Overall it was pleasing to find that over half the candidates scored all 4 marks with a further 29% scoring 3 marks.

1.2.14 Question 14

This question was not done at all well with over 65% of the candidates failing to score. 52° was commonly seen but it was nearly always not seen in angle ADC on the diagram and often seen as the answer. Many others gave an answer of 128° . A few candidates gained a mark for 128×2 or 256 seen but only 24% reached the correct answer of 104° .

1.2.15 Question 15

The majority of candidates realised they needed to use a trigonometric ratio but many chose the wrong one). Those who did choose to use the cosine ratio generally got the correct answer with just over 40% of the candidates scoring all 3 marks. Many used the sine rule but then did not continue with Pythagoras to find AB so no marks could be scored. Overall 55% of candidates failed to score any marks on this straightforward trig question.

1.2.16 Question 16

This question on bounds had a higher success rate than usual with over 40% of the candidates scoring all 3 marks. Where the candidate knew that the upper bounds of the lengths were 35.5 and 26.5 they often went on to achieve full marks. Those that did not usually had little idea as to how to approach the question at all. Unfortunately, nearly half the candidates failed to score. The most common error was to simply do 35×26 and then use the 910 to give an upper bound of 910.5 or something similar. A number of candidates considered 26.4 and 35.4 to be suitable bounds.

1.2.17 Question 17

35% of candidates gained full marks but nearly 60% of the candidates failed to score. A significant number of candidates showed no awareness of the need to find a common denominator.

Other common errors included:

- using 5 as the denominator,
- ignoring the denominator (after correctly using 6),
- arriving at $5x = 8$,
- multiplying only one of the terms on the LHS by 2 or 3,
- not equating the correct expression to 8

1.2.18 Question 18

Over 80% of the candidates failed to score on this question even though the first mark was awarded for any attempt to multiply both sides by $3 + n$ even if it was not quite accurately done. 10% of the candidates were able to do this and a further 5% went on to rearrange their equation correctly isolating the terms in n . However, factorising the terms in n proved a stumbling block for all except the most able.

1.2.19 Question 19

Generally candidates were more successful with part (a) than part (b) though 15% of candidates did gain all 5 marks. A significant number made no use of either the sine or cosine rules. Others clearly attempted to do so but appeared to forget to use at least one element - often the sine/cosine element! Several candidates used straightforward trig ratios or Pythagoras, as if the triangle were right angled. The most common error in (b) was to evaluate $(179.14 - 174.3) \times \cos 62^\circ$. Overall, nearly 60% of the candidates failed to score any marks on this final question on the paper.

2. STATISTICS

2.1. MARK RANGES AND AWARD OF GRADE

Unit/Component	Maximum Mark (Raw)	Mean Mark	Standard Deviation	% Contribution to Award
5381F/05	30	21.5	5.8	20
5381H/06	30	17.3	7.1	20
5382F/07	25	15.7	4.1	15
5382H/08	25	14.8	5.5	15
5383F/09	25	13.4	5.2	15
5383H/10	25	15.4	5.6	15
5384F/11F	60	33.2	10.5	25
5384F/12F	60	39.4	11.5	25
5384H/13H	60	28.8	11.8	25
5384H/14H	60	37.6	10.6	25

GCSE Mathematics Grade Boundaries for 2381- November 2010

The table below gives the lowest raw marks for the award of the stated uniform marks (UMS).

Unit 1 - 5381

	A*	A	B	C	D	E	F	G
UMS (max: 55)				48	40	32	24	16
Paper 5381F				27	22	18	14	10
UMS (max: 80)	72	64	56	48	40	36		
Paper 5381H	29	24	17	11	7	5		

Unit 2 Stage 1 - 5382

	A*	A	B	C	D	E	F	G
UMS (max: 41)				36	30	24	18	12
Paper 5382F				21	17	14	11	8
UMS (max: 60)	54	48	42	36	30	27		
Paper 5382H	23	19	15	11	9	8		

Unit 2 Stage 2 - 5383

	A*	A	B	C	D	E	F	G
UMS (max: 41)				36	30	24	18	12
Paper 5383F				19	15	11	8	5
UMS (max: 60)	54	48	42	36	30	27		
Paper 5383H	24	21	16	12	8	6		

Unit 3- 5384

	A*	A	B	C	D	E	F	G
5384F_11F				41	33	25	17	9
5384F_12F				49	40	31	23	15
5384H_13H	51	40	29	19	10	5		
5384H_14H	58	48	38	29	17	11		

	A*	A	B	C	D	E	F	G
UMS (max: 139)				120	100	80	60	40
5384F				90	73	56	40	24
UMS (max: 200)	180	160	140	120	100	90		
5384H	108	88	68	48	27			

UMS BOUNDARIES

Maximum Uniform mark	A*	A	B	C	D	E	F	G
400	360	320	280	240	200	160	120	80

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