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Examiners' Report March 2010

GCSE

GCSE Mathematics (2381)

Higher Paper (5383H/10)

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March 2010

1. PRINCIPAL EXAMINER'S REPORT – HIGHER - PAPER 10

1.1. GENERAL COMMENTS

1.1.1. This was an accessible paper that gave candidates ample opportunity to demonstrate their understanding. Some very good attempts at the paper were seen.

1.1.2. The use of three letter notation to name angles remains a weakness. It was clearly evident in question 7 that many candidates were unable to identify angle *ABO*.

1.1.3. Working out was frequently shown but there were still many instances where candidates gave the incorrect answer with no working. In some of these cases, it may well have been possible to award method marks if the working had been shown.

1.2. REPORT ON INDIVIDUAL QUESTIONS

1.2.1. Question 1

This straightforward percentage question was well answered but it was surprising that almost one candidate in five failed to get any marks. A variety of correct methods were seen. A popular approach was to find 10% of 120 and 5% of 120 and then add although many candidates used $\frac{15}{100}$ x 120 or 0.15 x 120. Some candidates found 15% of 120 but then went on to either subtract it from 120 or to add it to 120 which resulted in only one mark being awarded. The most common incorrect method was to divide 120 by 15, leading to an answer of 8.

1.2.2. Question 2

In part (i), the vast majority of candidates gave the correct value of 30^o for angle *a*. Candidates were less successful in part (ii) with just over half managing to give a correct reason. The majority of correct answers mentioned alternate angles, or Z angles, although some candidates gave valid reasons that involved more than one step, e.g. corresponding angles and vertically opposite angles. Co-interior or allied angles were used by some candidates but those who described angle *a* and the 150^o angle as C angles or interior angles gained no mark. Confusion between corresponding angles and alternate angles was very common and some answers contained contradictory reasons. Some candidates stated that angle *a* and the 150^o angle added up to 180^o because of angles on a straight line. Some answers simply mentioned the parallel lines.

1.2.3. Question 3

This question was answered very well. The majority of candidates were able to complete the table of values accurately and draw the correct straight line. In part (a) the most common error was an incorrect *y*-value for $x = -2$. Candidates with an error in the table frequently went on to draw the correct line but did not always return to part (a) to correct the table. Some candidates plotted the points correctly but failed to draw a straight line through them and a few did not draw a line long enough to join all the plotted points.

1.2.4. Question 4

This was not a particularly well answered question considering that the formula for working out the volume of a prism is given on the formulae page. Just under half of the candidates gained no marks. A common incorrect answer was 84. If candidates' working showed that this answer came from 4 x 3 x 7 then a method mark was awarded. Many candidates attempted to work out the surface area rather than the volume or simply multiplied all the given numbers together.

1.2.5. Question 5

Many candidates answered part (a) correctly although a significant number gave the answer $x^2 - 5$ rather than $x^2 - 5x$. Some wrote $2x$ rather than x^2. Candidates were less successful in part (b). Common incorrect answers were $4(y + 1.5)$ and $2(y + 3)$. Many candidates did not recognise the difference of two squares in part (c) and answers such as $x(x - 36)$ and $x(x - 6)$ were common. If the difference of two squares was recognised then the factorisation was usually correct although answers of $(x - 6)(x - 6)$ or $(x + 6)(x + 6)$ were quite common.

1.2.6. Question 6

The majority of candidates were able to write 2.7×10^5 as a normal number in part (a). Incorrect answers usually contained too few zeros or too many zeros.

In part (b), many candidates did not give the correct answer in standard form but gained one mark for either 12×10^7 or 120 000 000. Those who chose to write the given numbers as ordinary numbers before multiplying were less successful. A common error was to write 3×10^{-2} as 0.003 or 0.3.

1.2.7. Question 7

There was good recognition of the 90^o angle between a radius and a tangent and this was often marked on the diagram. However, it was apparent that a large number of candidates could not correctly identify angle ABO. Many worked out angle AOB as 140^o and gave that as the final answer. Those who drew the line AB on the diagram were more successful but even some of these candidates found the size of angle ABO and marked it on the diagram but then gave 140^o, the size of angle AOB, as the final answer. Some candidates gave

angle AOB as 80^o from incorrectly applying 'the angle at the centre is twice the angle at the circumference'.

1.2.8. Question 8

This question was poorly answered with many candidates failing to realise they had to factorise. A large amount of incorrect algebra was seen as candidates attempted to cancel individual terms in the numerator with similar terms in the denominator or tried to simplify the numerator and denominator by 'combining' the terms, e.g. adding $3x^2$ and 6x to give $9x^3$. Those who did attempt to factorise were often able to factorise the numerator correctly but struggled with the denominator. Factorising a quadratic expression in which the coefficient of x^2 was not 1 seemed to present significant difficulties. Signs were a problem and some candidates attempted to take out a common number factor before factorising into two brackets.

1.2.9. Question 9

Most candidates did not know how to approach this question. Many made no attempt at all or simply divided 47 by 110 on their calculator and assumed that this was a proof. Of those who did make an attempt at a proof, many failed at the first hurdle by writing the recurring decimal incorrectly. Mistakes were also frequently made when working out $10x$, $100x$, $1000x$, etc. Those who used two correct decimals and subtracted often went on to get full marks. Some candidates, however, used two recurring decimals that did not give a terminating decimal after subtraction. Methods that used addition were also very common. These usually involved adding $100x$ and $10x$ to give 46.9999... but almost all of the candidates who used this approach failed to gain full marks as they did not appreciate the need to prove that 46.9999... = 47.

2. STATISTICS

2.1. MARK RANGES AND AWARD OF GRADE

Unit/Component	Maximum Mark	Mean Mark	Standard Deviation	% Contribution to Award
5381F/05	30	18.6	5.3	20
5381H/06	30	17.3	6.7	20
5382F/07	25	14.6	4.2	15
5382H/08	25	13.9	5.0	15
5383F/09	25	13.1	5.4	15
5383H/10	25	13.9	5.4	15

GCSE Mathematics Grade Boundaries 2381 – March 2010

Unit 1 – 5381

	A*	A	B	C	D	E	F	G
UMS (max: 55)				**48**	**40**	**32**	**24**	**16**
Paper 5381F				**24**	20	16	**13**	10
UMS (max: 80)	**72**	**64**	**56**	**48**	**40**	**36**		
Paper 5381H	28	**23**	16	**10**	**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				**19**	16	13	10	7
UMS (max: 60)	**54**	**48**	**42**	**36**	**30**	**27**		
Paper 5382H	23	**19**	14	**10**	**8**	7		

Unit 2 Stage 2 – 5383

	A*	A	B	C	D	E	F	G
UMS (max: 41)				**36**	**30**	**24**	**18**	**12**
Paper 5383F				**20**	15	11	**7**	3
UMS (max: 60)	**54**	**48**	**42**	**36**	**30**	**27**		
Paper 5383H	23	**19**	14	**10**	**7**	5		

2.2. 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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