UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2009 question paper

for the guidance of teachers

0607 CAMBRIDGE INTERNATIONAL MATHEMATICS

0607/06 Paper 6 (Extended), maximum raw mark 40

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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M marks are given for a correct method.
A marks are given for an accurate answer following a correct method.
B marks are given for a correct statement or step.
D marks are given for a clear and appropriately accurate drawing.
P marks are given for accurate plotting of points.
E marks are given for correctly explaining or establishing a given result.
C marks are given for clear communication.

Abbreviations

cao	correct answer only
cso	correct solution only
ft	follow through
oe	or equivalent
soi	seen or implied
ww	without working
www	without wrong working

Section A

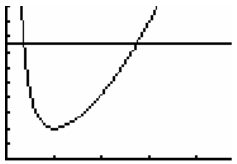
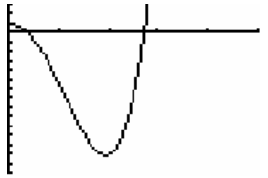
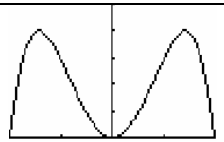
Question	Answer	Mark	Notes	Comments
1	Number of discs / Last disc: 2/2, 3/2, 4/4, 5/2, 6/4, 7/6, 8/8; 9/2, 10/4, 11/6, 12/8, 13/10, 14/12, 15/14, 16/16; 17/2, 18/4, 19/6, 20/8	7	**B7**	1 for each shaded square **[7]**
2	32, 64, 128	2	**B1** for 32 **B1** for 64 and 128	**[2]**
3 (a)	2	1	**B1**	
(b)	122	2	**B2** **M1** for 2(125 – their 64) or their 128 – 2(their 128–125) oe **A1** for correct evaluation	Dependent on 3 values in Question 2 ft from their 128

(c)	144	2	**B2** OR **M1** for 2(200 – their 128) or 256 – 2(256 – 200) oe **A1** for correct evaluation	ft with 2 × their 128 for 256
(d)	68928	3	**B3** OR **M1** evidence of 16 or 17 or 65536 or 131072 seen **M1** for $2(100\,000 - 2^{16})$ or $2^{17} - 2(2^{17} - 100000)$ oe **A1** for correct evaluation If 0 scored, **SC2** 34464	$\frac{\log 100000}{\log 2} = 16.6$ **[8]**
4	$2^n + 5$ for $n > 2$	3	**B1** for 2^n **B1** for $n > 2$ oe **B1** for + 5 or 5 more than (2, 4,) 8, 16, 32… oe OR **SC3** for $2^{n+2} + 5$	Ignore "n=" and subsequent "working" **[3]**

5	**(a)**	**(i)** (10) 8, 6, 4, 2, 9, 5, 1, 3 (7)	1	**B1**	Accept one omission or error.
		(ii) corresponding terms add to 11	1	**B1** ft with consistent pattern	Accept a diagram indicating this
	(b)	**(i)** $x + y = n + 1$ oe	1	**B1** ft with their consistent pattern	
		(ii) 29	2	**B2** ft with their consistent pattern OR **M1** 72 identified OR anticlockwise table	**[5]**
			2	**C1** for communication by one of: **C2** for communication by at least two of: Showing strategy Comparing Checking.	Award marks for: Strategy shown in question 2 question 3(b) 3(c) 3(d) Variables defined in question 4 Indicating comparison of corresponding terms in question 5(a)(ii) Strategy shown in question 5(b)(ii) Checking of a result **[2]**
					[Total: 27 scaled to 24]

Section B

Question	Answer	Mark	Notes	Comments
1	(–2, 7.52) (2, 7.52) (0, 2)		**B2** **SC1** for (± 4, 7.52) **B1**	One for each point, seen anywhere Accept inclusion of units **[3]**
2	(y =) ax^2+b	1	**B1**	Accept mention of quadratic **[1]**
3	2	1	**B1ft** from (0, their 2)	**[1]**
4	1.38	2	**B2** OR **M1** for substituting (± 2, 7.52) or their A or B into their function soi, **A1** correct evaluation	Allow follow-through Condone -2^2 appearing **[2]**
5	5.1(1m) or 5.1(05m)	2	**B2** OR **M1** for substituting x = ± 1.5 **A1** correct evaluation OR **SC1** correct answer from substituting x = ± 0.5	Allow follow-through Implied by 2.345 or 2.09 or better **[2]**

6 (a)	1 www	2	**M1** Substituting (0, their 2) to get $2 = k\,(w^0 + \frac{1}{w^0})$ **A1** k = 1 or $\frac{their\,2}{2}$	
(b)	2.7(17..) www	3	**M1** Substitute their A or B **M1ft**  **A1ft** w = 2.7(17….)	Allow follow-through (or k not yet found) $(\pm 2, 7.52)$ gives $7.52 = w^2 + \frac{1}{w^2}$ $w^2 = \frac{7.52 \pm \sqrt{7.52^2 - 4}}{2}$  Allow extra decimal places **[5]**
7 (a)		2	**G1** approximate shape **G1** through (0,0) dependent	Accept reflection in x-axis Allow domain beyond –2 to 2. Follow-through only if quadratic in question 2.
(b)	0.4(m) to 0.45(m)	1	**B1ft**	**[3]**
		2	**C1** for communication by one example of: **C2** for communication by at least three examples of: Showing strategy Checking Scale.	Working shown in Question 4 Question 5 Question 6(a) Question 6(b) Scale in Question 7(a) **[2]**
				[Total: 19 scaled to 16]