

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

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Section A

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

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(c)	144	2	B2 OR M1 for $2(200 - \text{their } 128)$ or $256 - 2(256 - 200)$ oe A1 for correct evaluation	ft with $2 \times \text{their } 128$ 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 $2^{17} - 2(2^{17} - 100\,000)$ oe A1 for correct evaluation If 0 scored, SC2 34464	$\frac{\log 100000}{\log 2} = 16.6$
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"

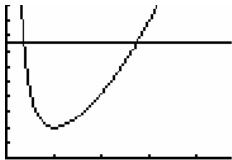
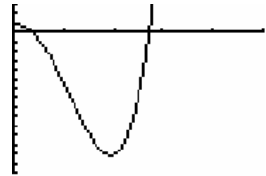
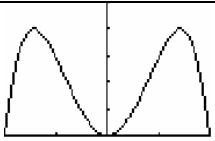
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5	(a)	(i) (10) 8, 6, 4, 2, 9, 5, 1, 3 (7)	1	B1	Accept one omission or error.
		(ii) corresponding terms add to 11	1	B1 ft with consistent pattern	Accept a diagram indicating this
	(b)	(i) $x + y = n + 1$ oe	1	B1 ft with their consistent pattern	
		(ii) 29	2	B2 ft with their consistent pattern OR M1 72 identified OR anticlockwise table	
			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
					[Total: 27 scaled to 24]

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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 $x = \pm 1.5$ A1 correct evaluation OR SC1 correct answer from substituting $x = \pm 0.5$	Allow follow-through Implied by 2.345 or 2.09 or better [2]

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