UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2010 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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Page 2	Mark Scheme: Teachers' version	Syllabus	Paper
	IGCSE – May/June 2010	0607	06

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

Page 3	ge 3 Mark Scheme: Teachers' version		Paper
	IGCSE – May/June 2010	0607	06

Question	Answer	Mark	Notes			Commer	nts
A 1 (a) (b)	2 8	1	B1 B1	Communication mark possible for complete method shown.			
2	Prime Division Remainder 3 $2^3 \div 3$ 2 5 $2^5 \div 5$ 2 7 $2^7 \div 7$ 2 11 $2^{11} \div 11$ 2	Division $3^{5} \div 5$ $3^{7} \div 7$ $3^{11} \div 11$	3 3	Divis $4^{5} \div 4^{7} \div 4^{11} \div$	- 5 - 7	Remainder 4 4 4	
		3	Deduct $\frac{1}{2}$ for error or omiss: and round dow B3	ion			
3 (a)	11 7	1	B1				
(b)	17 8	1	B1				
4 (a)	$5^{13} \div 13$ 13 $5(5^{12} - 1)$ 13	4	B1 B1 B1 + B1				
(b)	17	1	B1		Accept 3, 5, 7, 13, 97, 241, 257, 653		
5	p	1	B1		Accept $(p-1) + 1$ or $p-1+1$		
6	Expression with p prime and a factor of a For example $10^{5-1} - 1$ or $10^4 - 1$ Evaluation and comment that p is not a factor	2	B1 R1		Ignore extra expressions		
7	$7^{24} - 1 = \left[\left(7^{12} \right)^2 - 1 \right] = \left(7^{12} \right)^{3-1} - 1$ so 3 is prime factor $7^{24} - 1 = \left[\left(7^6 \right)^4 - 1 \right] = \left(7^6 \right)^{5-1} - 1$	4	M1 A1		Apply to one correct answer		
	so 5 is prime factor $7^{24} - 1 = [(7^2)^{12} - 1] = (7^2)^{13-1} - 1$ so 13 is prime factor		B1 B1		answ each	ly to other covers deducting incorrect	g one for
		1	C1		19,4 Com	her prime fact 3,73,181,193 nmunication stion 1	,409,1201

Page 4	Page 4 Mark Scheme: Teachers' version		Paper
	IGCSE – May/June 2010		06

Question	Answer	Mark	Notes	Comments
В				
1 (a)	20	1	B1	
(b)	$\frac{20}{1\frac{1}{2}}$ oe	1	R1	Averaging speeds possible
2	$\frac{10+5}{1\frac{1}{4}} \text{oe}$	2	R1 15 ÷1.25 with time in any form	Accept $12 \times 1.25 = 15$
			R1 for 15 and $1\frac{1}{4}$	
3	11.6 to 11.7(km/h)	2	shown in working $M1 \frac{10+4}{1\frac{1}{5}} \text{ oe}$	Ignore extra methods Communication mark possible but not for model or $\frac{840}{72}$
4 (a)	$\frac{10 + 20 \times \frac{x}{60}}{1 + \frac{x}{60}}$ oe for numerator	2	B1 for numerator or denominator seen	
(b)	Evidence of either multiplying top and bottom by 60 or common denominators of 60 oe.	1	R1	
5	11.7 to 11.8(km/h)	1	B1	Communication mark (can be evidence of substitution)
6	-0 -0 	2	G1 correct shape G1 start at (0, 10)	
7	26 or better	2	M1 Sketch showing intersection of graphs M1 600 + 20x = 13(60 + x)	Communication mark for complete correct method shown or described. Reverse substitution statement does not gain communication

Page 5	Mark Scheme: Teachers' version	Syllabus	Paper
	IGCSE – May/June 2010	0607	06

8	(a)	$(S=) \frac{600 + yx}{60 + x}$ oe	1	B1	
	(b)	3	2	$M1 \frac{600 + 24y}{60 + 24} = 8$	Communication mark
				soi A1ft for at least same level of difficulty	
	(c)		2	G1 decreasing from a point on the <i>y</i> -axis	
				G1 <i>x</i> -axis asymptote	
		6	1	C1	Communication seen in two of questions 3, 5, 7, 8(b)