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.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

- CIE will not enter into discussions or correspondence in connection with these mark schemes.

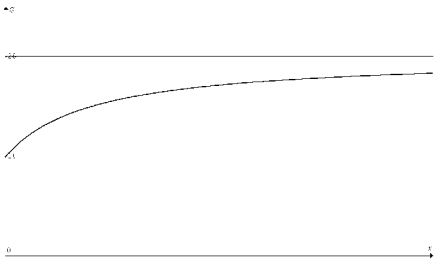
CIE is publishing the mark schemes for the May/June 2010 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

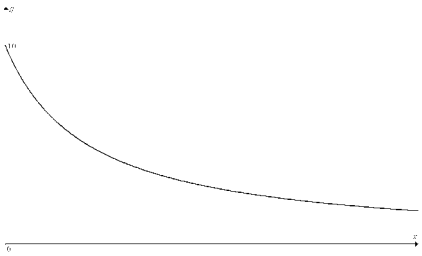
M marks are given for a correct method.
A marks are given for an accurate answer following a correct method.
B marks are given for a correct statement or step.
D marks are given for a clear and appropriately accurate drawing.
P marks are given for accurate plotting of points.
E marks are given for correctly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

Question	Answer	Mark	Notes	Comments
A				
1 (a)	2	1	B1	Communication mark possible for complete method shown.
(b)	8	1	B1	
2	<table><tr><th>Prime</th><th>Division</th><th>Remainder</th><th>Division</th><th>Remainder</th><th>Division</th><th>Remainder</th></tr><tr><td>3</td><td>$2^3 \div 3$</td><td>2</td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td>$2^5 \div 5$</td><td>2</td><td>$3^5 \div 5$</td><td>3</td><td>$4^5 \div 5$</td><td>4</td></tr><tr><td>7</td><td>$2^7 \div 7$</td><td>2</td><td>$3^7 \div 7$</td><td>3</td><td>$4^7 \div 7$</td><td>4</td></tr><tr><td>11</td><td>$2^{11} \div 11$</td><td>2</td><td>$3^{11} \div 11$</td><td>3</td><td>$4^{11} \div 11$</td><td>4</td></tr></table>			
		3	Deduct $\frac{1}{2}$ for each error or omission and round down B3	Ignore extra entries
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	$7^{24} - 1 = [(7^{12})^2 - 1] = (7^{12})^{3-1} - 1$ so 3 is prime factor $7^{24} - 1 = [(7^6)^4 - 1] = (7^6)^{5-1} - 1$ so 5 is prime factor $7^{24} - 1 = [(7^2)^{12} - 1] = (7^2)^{13-1} - 1$ so 13 is prime factor	4 1	M1 A1 B1 B1 C1	Apply to one correct answer Apply to other correct answers deducting one for each incorrect Further prime factors are 19,43,73,181,193,409,1201 Communication seen in question 1

Question	Answer	Mark	Notes	Comments
B				
1 (a)	20	1	B1	
(b)	$\frac{20}{1\frac{1}{2}}$ oe	1	R1	Averaging speeds possible
2	$\frac{10+5}{1\frac{1}{4}}$ oe	2	R1 15 ÷1.25 with time in any form R1 for 15 and $1\frac{1}{4}$ shown in working	Accept 12 × 1.25 = 15
3	11.6 to 11.7(km/h)	2	M1 $\frac{10+4}{1\frac{1}{5}}$ 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		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

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