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

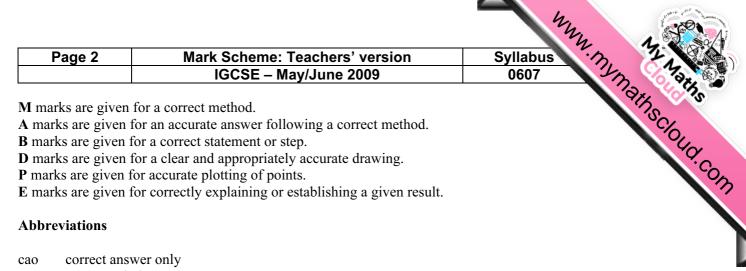## 0607 CAMBRIDGE INTERNATIONAL MATHEMATICS

0607/02   Paper 2 (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.

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CIE is publishing the mark schemes for the May/June 2009 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.

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

1	(a)	$4 \times 3.8 \times 10^5$ $1.52(0\ldots) \times 10^6$	**M1** **A1**	If zero scored **SC1** for 1.5×10^6 ww. www 2 **[2]**
2	(a)	2	**B1**	
	(b)	120	**B1**	Accept $\dfrac{2\pi}{3}$ **[2]**
3		$x = 45$ $y = 40$ $z = 70$	**B1** **B1** **B1**	Answers on the diagram can be accepted on the diagram unless contradicted in the answer spaces. **[3]**
4	(a)	$\dfrac{1}{3}(p+q)$ oe	**B1**	
	(b)	$\sqrt{xy}$ or any unambiguous equivalent	**B1**	Accept $\pm$, $-$, $+$ Not $\sqrt{\ }xy$ **[2]**
5	(a)	$-3, -2, -1, 0, 1$	**B1**	
	(b)	29, 31	**B1**	
	(c)	$-4, 4$	**B1**	**[3]**
6	(a)	log 9	**B1**	Accept 2 log 3
	(b)	$4\sqrt{2}$ or $2\sqrt{8}$ or $\sqrt{32}$	**B2**	**B1** for two of $7\sqrt{2}$ or $5\sqrt{2}$ or $2\sqrt{2}$ seen **[3]**
7	(a)	35, 48	**B1**	
	(b)	$n^2 - 1$ oe	**B2**	**B1** for n^2, or $n^2 + c$ seen, or $n = n^2 - 1$ or **M1** for difference method seen as far as third line (all 2's) **[3]**

8	(a)	Correct translation. Top of flag at (2,1)	D2	**D1** any other translation. Igno~~r~~
	(b)	Correct reflection. Top of flag at (3,3)	D2	**D1** Reflection $y = 1$, or reflecting the P in $x = 1$
				[4]
9		Attempt to get 2 equations for elimination	M1	Condone 1 slip
		Correct addition/subtractions of their equations	M1	Condone 1 further slip (dep on first **M1**)
		$x = -1$	A1	
		$y = 3$	A1	
		OR	**OR**	
		Equation $x =$ or $y =$ from one equation	M1	Condone 1 slip
		Substitute their expression into other equation correctly	M1	No further slips (dep on first **M1**)
		$x = -1$	A1	
		$y = 3$	A1	
		www 4		**[4]**
10		For correct multiplication by $t -2$	M1	Can be in any order
		For a correct division by y	M1	
		For adding 2 or $2y$ correctly as appropriate	M1	
		Leading to		
		$t = \dfrac{a + 2y}{y}$ or $t = \dfrac{a}{y} + 2$		Final answer must be correct to score **M3**
		www 3		**[3]**
11	(a) (i)	$\begin{pmatrix} 6 \\ -3 \end{pmatrix}$ cao	B1	
	(ii)	$6^2 + 3^2$	M1	
		$= \sqrt{45}$ or $3\sqrt{5}$	A1ft	Only if **(a)(i)** is in non zero integer form
	(b)	Gradient $= \dfrac{-3}{6}$ oe	B2	If **B0** then **B1ft** for Gradient $= \dfrac{change\ in\ their\ y}{change\ in\ their\ x}$ **B1** for negative gradient (indep) If still **B0 SC1** for $\dfrac{-3}{6}x$ oe
	(c)	Midpoint $= (0, \dfrac{7}{2})$ oe cao	B1	
	(d)	Gradient of perpendicular $= 2$ or $\dfrac{-1}{their(b)}$	B1ft	Implied by $(y =)\ 2x \pm c$
		$y = mx + \dfrac{7}{2}$ oe (indep)	B1	
				[8]
12	(a)	64	B1	
	(b)	$\dfrac{3}{4}$ or 0.75	B2	If B0, then B1 for $(\dfrac{\sqrt{3}}{2})^2$ seen
				[3]