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.

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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.

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. Ignore labels
	(b)	Correct reflection. Top of flag at (3,3)	D2	D1 Reflection $y = 1$, or reflecting their 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]