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