

**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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**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

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

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