UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2012 question paper

for the guidance of teachers

0607 CAMBRIDGE INTERNATIONAL MATHEMATICS

0607/23   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.

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

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1	(a)		$(\pm)\dfrac{1}{7}$ (0.1528…)	1	Accept $-\dfrac{1}{7}$ (–0.1528...)	
	(b)		$\pm\dfrac{1}{2}$ ($\pm$ 0.5)	2	**M1** for $x^2 = \dfrac{1}{4}$ soi	[3]
2	(a)		$(3x - 2)(2x + 1)$	2	**SC1** for a pair of brackets which multiply out to give 2 terms correct	
	(b)		$\dfrac{2}{3}, -\dfrac{1}{2}$	1ft	ft from their **(a)** only if **SC1** scored in **(a)**. Strict ft but can start again to achieve correct answer and score. [3]	
3	(a)		$\begin{pmatrix} 13 \\ -9 \end{pmatrix}$	2	**B1** for $\begin{pmatrix} 13 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ -9 \end{pmatrix}$ seen	
	(b)		$\sqrt{13}$ isw	2	**B1** for $2^2 + 3^2$ seen or implied by $\pm\sqrt{13}$ [4]	
4			56, 92	2	**B1** for 56, **B1** for 92 After B0, B0, award SC1 for 25 and 36 seen. [2]	
5	(a)		$(q - y)(p - x)$ oe	2	**B1** for $p(q - y) + x(y - q)$ or better, or $q(p - x) + y(x - p)$ or better	
	(b)		$2(4c - 5d)(4c + 5d)$	2	**B1** for $2(16c^2 - 25d^2)$ or $(8c - 10d)(4c + 5d)$ or $(4c - 5d)(8c + 10d)$ [4]	
6	(a)	(i)	3	1		
		(ii)	$180°$ or π	1		
	(b)		$y = 3\sin 2x$ drawn	B2	After **B0**, **SC1** for any wave with correct amplitude or *their* amplitude **and** **SC1** for wave passing through (0,0) with correct period or *their* period [4]	
7			$p = -1$, $q = 2.5$ or 5/2	4	**M1** for attempt to get 2 equations for elimination. Condone 1 numerical slip **M1** for correct addition/subtraction of *their* equation. Condone 1 further numerical slip (dep) A1, A1 for each **Or** **M1** for equation in form $x =$ or $y =$. Condone 1 numerical slip **M1** for substitution of *their* equation into the other correctly. No further slip A1, A1 for each **Or wwwSC3** for either $p = -1$ or $q = 2.5$ [4]	
8			$x = 5$	3	**M2** for $y = 12x^2$ **or** $\dfrac{108}{300} = \dfrac{3^2}{x^2}$ oe **M1** for $y = kx^2$ $(k \neq 1)$ [3]	

9		13.5	3	**B1** for total distance = 27km **B1** for total time = 2 hours	
10		$x = -5$	3	**M1** for multiplying all <u>3</u> terms by 14, or LHS over 14 = 1, or all over 14 **A1** for $2(x + 3) - 3(x - 1) = 14$, or $\dfrac{2x + 6 - 3(x - 1)}{14} = 1$ oe with other denominator e.g. 98 −5 may be seen embedded	**[3]**
11	**(a)**	log 6	1		
	(b)	3^y	1		
	(c)	3	1	Accept ±3 or –3	**[3]**
12	**(a)**	$-\dfrac{1}{2}$ oe	1	isw (incorrect cancelling only)	
	(b)	For co-ordinates of $D = (2, 4)$	**M1**		
		For gradient of $CD = \dfrac{6}{4}$ oe e.g. ('4' – –2)/('2' – –2)	**M1**	Can imply previous M1 i.e. Correct method using their D	
		Gradients not negative reciprocals oe	**E1**	Dep on M2 and <u>no</u> errors in **(b)**	[4]