CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2013 series

0581 MATHEMATICS

0581/23   Paper 2 (Extended), maximum raw mark 70

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 should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

Abbreviations

cao   correct answer only
cso   correct solution only
dep   dependent
ft   follow through after error
isw   ignore subsequent working
oe   or equivalent
SC   Special Case
www   without wrong working
soi   seen or implied

Qu		Answers	Mark	Part Marks
1		£ or pound[s] **Correct working must be shown**	2	**M1** for 425 ÷ 1.14 or 365 × 1.14
2		$\dfrac{30}{300}$ oe www	2	**M1** for 30 seen or $\dfrac{k}{300}$ seen
3		1500 or 3 <u>pm</u>	2	**B1** for 1h50 or 2h[0]5 or **SC1** for 1255 + *their* 1h50 + 15mins correctly evaluated
4	(a)	[±] **2.28** or 2.282 to 2.2822	1	
	(b)	**0.109** or 0.1094[3…]	1	
5		$\left(\dfrac{2}{3}\right)^{1.5}$ $\left(-\dfrac{2}{3}\right)^{\frac{2}{3}}$ $(1.5)^{\frac{2}{3}}$ $\left(\dfrac{2}{3}\right)^{-1.5}$	2	**M1** for at least 2 correct decimals seen 1.3[1..] 0.5[4..] 1.8[3..] or 1.84 0.7[6..]
6		6	3	**M2** for $3 \times \sqrt[3]{\dfrac{288\pi}{36\pi}}$ or **M1** for $3 \times \sqrt[3]{\dfrac{288\pi}{36\pi}}$ or $3 \times \sqrt[3]{\dfrac{36\pi}{288\pi}}$
7		260	3	**M2** for [2 ×](4 × 10 + 18 × 5) oe or **M1** for a correct area statement
8		2500	3	**M1** for $m = kr^3$ **A1** for $k = 20$
9	(a)	1.1×10^5	2	**B1** for 110 000 oe e.g.11 × 10⁴
	(b)	5×10^3	2	**B1** for 5000 oe e.g. 0.5 × 10⁴

10		25	4	**M1** for correct method to eliminate variable **A1** for $x = 11$ **A1** for $y = 3$ **B1 FT** for $2 \times$ *their* x + *their* y correctly evaluated
11	**(a)**	77	2	**M1** for 11,13,17,19 clearly identified, ignore numbers less than 8 with no other numbers greater than or equal to 8 besides possibly an extra 17
	(b)	either 18 or 19 or both	2FT	**M1** for 11,13,17 clearly identified, ignore numbers less than 8 with no other numbers greater than or equal to 8 besides possibly an extra 17 or for *their* (a) $- 58$
12	**(a)**	$\dfrac{5}{25}$ oe	2	**B1** for answer $\dfrac{5}{k}$ or $\dfrac{k}{25}$
	(b)	$\dfrac{4}{25}$ oe	2	**B1** for answer $\dfrac{4}{k}$ or $\dfrac{k}{25}$
13		$\dfrac{8x}{(x-3)(x+1)}$	4	**B1** for common denominator $(x-3)(x+1)$ seen **B1** for $(x+3)(x+1) - (x-1)(x-3)$ soi **B1** for $x^2 + 3x + x + 3$ or $x^2 - 3x - x + 3$ soi
14	**(a)**	$n < 9$	2	**M1** for $2n < 18$ or $2n - 18 < 0$ oe If 0 scored **SC1** for 9 with incorrect inequality.
	(b)	$(b + d)(a + c)$	2	**B1** for $b(a + c) + d(a + c)$ or $a(b + d) + c(b + d)$
15	**(a)**	4	2	**M1** for attempt at sum of all numeric and x terms equated to 74
	(b)	26	1FT	$=18 + 2 \times$ their (a)
	(c)	8	1	
16	**(a)**	1.5	2	**B1** for [g(18) =] 4
	(b)	$2(x + 5)$ or $2x + 10$	2	**M1** for correct first step e.g. $x = \dfrac{y}{5} - 5$ or $\dfrac{x}{2} = y + 5$ or $2y = x - 10$

17	(a)	$\begin{pmatrix} 7 & 23 & 16 \\ 12 & 45 & 27 \end{pmatrix}$	2	**B1** for any one row or column corre[...] be in a 2 by 3 matrix
	(b)	$\dfrac{1}{3}\begin{pmatrix} 6 & -3 \\ -3 & 2 \end{pmatrix}$	2	**B1** for $k\begin{pmatrix} 6 & -3 \\ -3 & 2 \end{pmatrix}$ or $\dfrac{1}{3}\begin{pmatrix} a & b \\ c & d \end{pmatrix}$
18		**15.4** or 15.35 to 15.36	4	**M1** for $\dfrac{120}{360} \times \pi \times 5^2$ oe **M1** for $\dfrac{1}{2} \times 5^2 \times \sin 120$ oe **M1** for $\dfrac{120}{360} \times \pi \times 5^2 - \dfrac{1}{2} \times 5^2 \times \sin 120$ oe
19	(a)	hexagon	1	
	(b) (i)	$-\mathbf{b} + \mathbf{c}$	1	
	(ii)	$\mathbf{b} - \frac{1}{2}\mathbf{c}$	2	**B1** for **OB + BA** or any correct route
	(iii)	$-\mathbf{b} + \mathbf{c}$	1FT	= *their* (b)(i)
20	(a)	$[\pm]\ 3.1623$ cao	2	**M1** for $\sqrt{10}$ seen
	(b)	$\dfrac{4}{y^2 - 8}$ oe final answer	4	**M1** first move completed correctly **M1** second move completed correctly **M1** third move completed correctly **M1** final move completed correctly on answer line