UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2011 question paper

for the guidance of teachers

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 must be read in conjunction with the question papers and the report on the examination.

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

Qu.	Answers	Mark	Part Marks
1	112	2	**M1** for $240 \div (7 + 8) \times 7$
2	**(a)** 211 cao	1	
	(b) 216 cao	1	
3	$(x =) -3 \quad (y =) 5$	2	**M1** for correctly eliminating one variable
4	$\dfrac{16}{81}$ cao	2	**B1** for $\dfrac{81}{16}, \dfrac{k}{81}, \dfrac{16}{k}$ or $(2/3)^4$ seen
5	**(a)** 1.28×10^5	1	
	(b) 128 500	1	
6	882	2	**M1** $800 \times 1.05 \times 1.05$
7	$\dfrac{1}{9}, \dfrac{1}{4}$	**M1**	Both fractions seen
	$\left(\dfrac{1}{9} + \dfrac{1}{4} =\right) \dfrac{4}{36} + \dfrac{9}{36} = \dfrac{13}{36}$	**E1**	Both fractions over a common denominator and added to give $\dfrac{13}{36}$
8	0.186	2	**B1** for 2.477 to 2.478 or 13.29… seen
9	**(a)** 5 or –5	1	
	(b) -0.714 (-0.7143 to -0.7142) or $-\dfrac{5}{7}$	2	**M1** for $-2 + 2 + 1 - 3 - 1 - 2$ and $\div 7$
10	9 h 12 min	3	**M1** for 8×1.15 **A1** for 9.2 **B1 ft** independent for their 9.2 correctly converted into hours and minutes
11	$x(p - 2q)(p + 2q)$	3	**M2** for $(px - 2qx)(p + 2q)$ or $(p - 2q)(px + 2qx)$ or **M1** for $x(p^2 - 4q^2)$
12	225.(23112)	3	**M2** for $(800 \div 3.8235 - 150) \times 3.8025$ **M1** for $800 \div 3.8235$
13	68.5 www	3	**M2** for $67.13 \div 0.98$ or **M1** for 67.13 is 98%
14	$66\dfrac{2}{3}$ or 66.7 www	3	**M2** for $\dfrac{\frac{4}{3}\pi r^3}{\pi r^2 (2r)}$ ($\times 100$) or **M1** for $\pi r^2 (2r)$
15	$p = \dfrac{c}{a - x}$	3	**M1** one correct move **M1** second correct move **M1** third correct move marked on answer line

16	(a) $t = 2\sqrt{l}$	2	**M1** for $t = k\sqrt{l}$
	(b) 3	1ft	Ft dependent on using $t = k\sqrt{l}$
17	(ii) 7	1	
	(ii) 4	1	
	(b) $\dfrac{7}{13}$ oe	1ft	Ft their Venn diagram or their **(a)(i)**/13
18	$\dfrac{1 - 5x + x^2}{x(1 - 2x)}$ or $\dfrac{1 - 5x + x^2}{x - 2x^2}$	4	**M1** for $(1 - x)(1 - 2x) - x(2 + x)$ seen **B1** for $1 - x - 2x + 2x^2$ or $1 - 3x + 2x^2$ seen **B1** for $x(1 - 2x)$ oe as a common denominator
19	4.32	4	**M1** for $\dfrac{50}{360} \times \pi \times 9^2$ **M1** for $0.5 \times 9^2 \times \sin 50$ **M1** for subtracting their triangle from their sector (dependent on at least M1)
20	(a) (i) 2×2	1	
	(ii) (20)	1	Brackets essential
	(b) $\dfrac{1}{2}\begin{pmatrix} 4 & -3 \\ -2 & 2 \end{pmatrix}$ oe	2	**M1** for $\dfrac{1}{2}\begin{pmatrix} a & b \\ c & d \end{pmatrix}$ or $k\begin{pmatrix} 4 & -3 \\ -2 & 2 \end{pmatrix}$ seen
21	(a) 84(.00..)	4	**M2** for $\cos(\ldots) = \dfrac{2.7^2 + 4.5^2 - 5^2}{2 \times 2.7 \times 4.5}$ or (**M1** for $5^2 = 2.7^2 + 4.5^2 - 2 \times 2.7 \times 4.5 \times \cos C$) **A1** for 0.1045… (implied by correct answer)
	(b) 136	1ft	220 – their **(a)**
22	(a) Angles in same segment	1	
	(b) (i) 8.2(0)	2	**M1** for $\dfrac{CX}{3.84} = \dfrac{9.4}{4.4} (= 2.136)$ oe
	(ii) 24.7	2	**M1** for $\dfrac{\Delta}{5.41} = \left(\dfrac{9.4}{4.4}\right)^2 (= 4.564)$ oe
23	(a) 0.133 (3…) or $\dfrac{2}{15}$	2	**M1** for $40 \div 300$ seen
	(b) $33\dfrac{1}{3}$ or 33.3	3	**M1** for area under graph attempted **M1** for correct total area statement