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

0580 MATHEMATICS

0580/23 Paper 2 (Extended), maximum raw mark 70

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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 ÷ (7 + 8) × 7
2	**(a)** 211 cao **(b)** 216 cao	**1** **1**	
3	(x =) –3 (y =) 5	**2**	**M1** for correctly eliminating one variable
4	$\frac{16}{81}$ cao	**2**	**B1** for $\frac{81}{16}, \frac{k}{81}, \frac{16}{k}$ or $(2/3)^4$ seen
5	**(a)** 1.28×10^5 **(b)** 128 500	**1** **1**	
6	882	**2**	**M1** 800 × 1.05 × 1.05
7	$\frac{1}{9}, \frac{1}{4}$ $\left(\frac{1}{9}+\frac{1}{4}=\right)\ \frac{4}{36}+\frac{9}{36}=\frac{13}{36}$	**M1** **E1**	Both fractions seen Both fractions over a common denominator and added to give $\frac{13}{36}$
8	0.186	**2**	**B1** for 2.477 to 2.478 or 13.29… seen
9	**(a)** 5 or –5 **(b)** –0.714 (–0.7143 to –0.7142) or $-\frac{5}{7}$	**1** **2**	 **M1** for –2 + 2 + 1 – 3 – 1 – 2 and ÷ 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 ÷ 3.8235 – 150) × 3.8025 **M1** for 800 ÷ 3.8235
13	68.5 www	**3**	**M2** for 67.13 ÷ 0.98 or **M1** for 67. 13 is 98%
14	$66\frac{2}{3}$ or 66.7 www	**3**	**M2** for $\frac{\frac{4}{3}\pi r^3}{\pi r^2 (2r)}$ (× 100) or **M1** for $\pi r^2 (2r)$
15	$p = \frac{c}{a - x}$	**3**	**M1** one correct move **M1** second correct move **M1** third correct move marked on answer line

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

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