UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2010 question paper for the guidance of teachers

0580 MATHEMATICS

0580/23 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.

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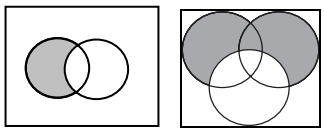
UNIVERSITY of CAMBRIDGE
International Examinations

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	–8.3	1	Allow $-8\frac{3}{10}$
2	21 55	1	Allow 9.55 pm
3	1.6305 cao	2	**B1** 4.33(44…) seen or answer 1.63, 1.630, 1.6304….
4		1, 1	
5	Correct working	2	**M1** $\frac{15}{4}+\frac{4}{3}=\frac{45}{12}+\frac{16}{12}$ **M1** $\frac{61}{12}=5\frac{1}{12}$
6	$4.93\% < \frac{20}{41} < 0.492 < \frac{80}{161}$	2	Allow decimal equivalents in answer space **M1** decimals 0.48(78..), 0.496(8..), 0.0493
7	1.14	2	**M1** 3.38 ÷ 1.04 (= 3.25) or **M1** 4.39 × 1.04
8	1200	2	**M1** figs 8 ÷ 40 × figs 9 ÷ 15 or **M1** (figs 8 × figs 9) ÷ (40 × 15)
9	9.6 cao	2	**M1** $\frac{x}{8}=\frac{12}{10}$ oe
10	216.32 cao	2	**M1** $200 \times (1 + (4/100))^2$ oe
11	13	2	**M1** 21 + 15 – 23 or **M1** $15 - x + x + 21 - x + 1 = 24$ oe
12	**(a)** 25 **(b)** 0.4	1 1	If zero scored **SC1** for 250 and 4 or 6.25 and 6.35
13	$10a + b$ or $a \times 10^1 + b\ (\times 10^0)$	2	**M1** $[a \times 10^7 + b \times 10^6] \div 10^6$

14	10.8 or $10\frac{70}{83}$	3	**M1** figs 10 ÷ time **M1** 10 ÷ 0.92r, 0.922 or 83/90
15	$y = -2x + 8$ cao oe	3	**M1** $(m =)\ \frac{8-2}{0-3}$ oe **B1** $c = 8$ or $y = mx + 8$ or subst. correct point in $y =$ "m" $x + c$
16	$\frac{4h}{g^2}$ or $h\left(\frac{2}{g}\right)^2$	3	**M1** squaring correctly **M1** clearing denominator correctly **M1** dividing by coefficient of i or **SC2** for correct unsimplified expression
17	$x = -1,\ y = 5$	3	**M1** consistent multiplication and either add or subtract **A1** for one correct after **M1**
18	315	3	**M1** $\frac{x}{360} \times 2 \times \pi \times 8$ oe **M1** $\frac{x}{360} \times 2 \times \pi \times 8\ (+ 16) = (16 +)\ 14\pi$
19	2.88	3	**M1** 40^3 oe seen **A1** 2 880 000 **B1ft** their 2 880 000 ÷ 100^3 or **B1** 0.000045 **M1** 40^3 **A1** cao or **M1** 0.4^3 **M1** 45×0.4^3 **A1**
20	**(a)** 63.4 **(b)** Vertices at (4, 1), (8, 1) and (10, 3)	2 2	**M1** $\tan(M) = \frac{4}{2}$ oe **B1** two vertices correct
21	**(a)** 2.4 oe **(b)** 680	1 3	 **M1** an area found **M1** $40 \times 20 - \frac{1}{2} \times 20 \times 12$ oe
22	$y \geqslant 1,\ x \leqslant 3, y \leqslant x + 5$ oe	5	**B1** y R 1 **B1** x R 3 **B2** y R $x + 5$ or **B1** y R $-x + 5$ where R is any inequality **B1** all 3 inequalities correct
23	**(a)** (Angles in) same segment **(b) (i)** 100 **(ii)** 43 **(iii)** 3	1 1 1 2	Allow (angles on) the same arc **B1** OBC or $OCB = \frac{1}{2}(180 - 86)\ (= 47)$

24	**(a)** $\frac{x-2y}{xy}$	2	**B1** correct numerator **B1** correct denominator
	(b) $\frac{x}{3}$ www	3	**M1** $x(x+1)$ **M1** $3(x+1)$
25	**(a)** –3	2	**B1** $g(\frac{1}{2}) = 2$ or $fg(x) = \frac{2}{x} - 7$ oe
	(b) $\frac{1}{2x-7}$	1	
	(c) $\frac{x+7}{2}$	2	**M1** for $y + 7 = 2x$ or $x = 2y - 7$