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

0580/21 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.

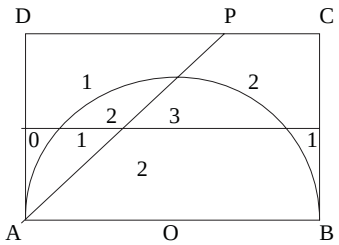
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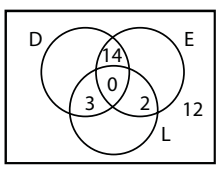
CIE is publishing the mark schemes for the October/November 2010 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

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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	20 (but **3, 4 and 8 must be seen www)**	2	**M1** 3, 4 and 8 seen www
2	1.2496 cao	2	Allow $1\frac{156}{625}$ **M1** 1 + 0.2 + 0.04 + 0.008 + 0.0016
3	2	2	**M1** $3x - 1 - 3x + 3$
4	0.9^3 0.9^2 $\sqrt{0.9}$ $\sqrt[3]{0.9}$	2	**M1** 0.94(8683…) 0.96(5489….) 0.8(1) 0.7(29)
5	**(a)** 5 **(b)** 2	1 1	
6	$1.15(2) \times 10^{-2}$	2	**M1** figs 115(2)
7	$\frac{5+x}{2x}$	2	**M1** 4 + 1 + x seen or **M1** $\frac{10+2x}{4x}$ oe
8	40.5	2	**M1** 6.75 seen or 6 × their LB
9	\$674.92, 674.9(0) or 675	3	**M2** $600 \times (1 + (4/100))^3$ or better oe or **M1** 600×1.04^2 oe
10	$x = 4$ $y = -3$	3	**M1** consistent mult and sub/add **A1** one correct value but M must be scored
11		3	Marks allocated for R in one of the regions shown
12	$x = +/- \sqrt{(5y)} - 3$ or $x = +/- \sqrt{5y} - 3$	3	**M1** correct move of the 5 completed **M1** correct move of the square completed **M1** correct move of the 3 completed

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13	$x < -3$	3	**M1** correct move **M1** correct move **M1** correct move
14	**(a)** 10(.0)	1	
	(b) $2\frac{1}{2}$, 2.5(0)	2	**M1** $2n - 3 = 2$
15	31.4 cao	3	**M1** $\frac{1}{2} \times 2 \times \pi \times 3$ oe **M1** $6 + 8 + 6 + 1 + 1 + k\pi$
16	$\frac{x-3}{x+2}$	4	**B2** $(x - 3)(x - 2)$ or **B1** $(x + a)(x + b)$ where $ab = 6$ or $a + b = -5$ **B1** $(x - 2)(x + 2)$
17	**(a)** $\begin{pmatrix} 8 & 0 \\ 0 & 8 \end{pmatrix}$ oe	2	**B1** for one column (or row) correct
	(b) $\begin{pmatrix} \frac{1}{4} & \frac{1}{4} \\ \frac{1}{4} & -\frac{1}{4} \end{pmatrix}$ oe	2	**B1** for $-1/8 \begin{pmatrix} a & c \\ b & d \end{pmatrix}$ or **B1** for $\begin{pmatrix} -2 & -2 \\ -2 & 2 \end{pmatrix}$ seen
18	**(a) (i)** Tangent	1	Correct tangent drawn
	(ii) 4.4 to 6	2	dep **M1** attempting to find gradient of their tangent
	(b) 780	2	**M1** evidence of finding the area under the graph ONLY from $t = 12$ to $t = 25$
19	**(a)** 20200	2	**M1** $65 \times 300 + 700$
	(b) 1260	2	**M1** 71190 / 56.5
20	$x = 0.84$ or 7.16	4	**B1** $\frac{8 \pm k}{2}$ **B1** $\sqrt{(8^2 - 4 \times 1 \times 6)}$ or better **A1 A1**
21	**(a)** Bisector	2	**B1** accurate line **B1** two sets of correct arcs
	(b) (4, 2)	1	
	(c) $y = -2x + 10$ oe	3	**B1** correct m **B1** correct c **M1** correct use of $y = mx + c$ oe on answer line
22	**(a)** 	4	**B1** 0 and 14 in correct place **B1** 2 in correct place **B1** 3 in correct place **B1** 12 in correct place
	(b) 11	1ft	**B1**ft 8 + their 3
	(c) 23	1ft	**B1**ft 21 + their 2

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