UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2010 question paper

for the guidance of teachers

0580 MATHEMATICS

0580/22 Paper 22 (Extended), maximum raw mark 70

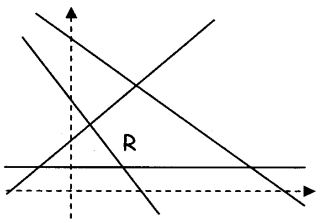
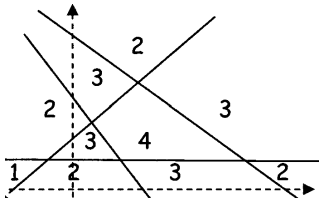
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Qu.	Answers	Mark	Part Marks
1	**(a)** 1	1	Allow none
	(b) 1	1	
2	0	2	**M1** $4\sin^3 120$ evaluated and rounding to 2.6 or better (2.598…) or $\frac{3\sqrt{3}}{2}$
3	$2-\sqrt{3}$, $2-\frac{\sqrt{3}}{2}$, $\frac{2}{\sqrt{3}}$, $\sqrt{3}$	2	**M1** correct decimals seen
4	$\frac{15a+32}{40}$ oe	2	**B1** $15a + 32$ seen or **SC1** $\frac{15a}{40}+\frac{32}{40}$ on answer line
5	2^{10}	2	**M1** 2^6 or 2^{-4} seen
6	6.4×10^7	2	**M1** $64 \times 100^2 \times 10^2$ or 64 000 000 oe
7	$(A \cup B \cup C)'$ $(A \cup C)' \cap B$	1 1	or $A' \cap B' \cap C'$ or $A' \cap (B \cup C)'$ or $A' \cap C' \cap B$
8	**(a)** 43 to 47	1	
	(b) 64 to 68	2	**SC1** 23 to 27
9	63.84 **cao**	3	**M1** figs 1995 **M1** 32 × their lower bound
10	$x = \frac{3}{P-1}$	4	**M1** for each of the four moves completed correctly
11	**(a)** 10(.0..)	1	
	(b) 9.80	3	**M2** $\sqrt{((\mathbf{a})^2 - 2^2)}$ or **M1** $PT^2 + 2^2 = (\mathbf{a})^2$
12	**(a)** 440	2	**M1** sin 37.1 or cos 52.9 = $\frac{h}{730}$ oe
	(b) 3 min 20 sec	2	**M1** $\frac{730}{3.65}$
13	**(a)** $\begin{pmatrix}6x-3\\4x+5\end{pmatrix}$ but not $\begin{pmatrix}6x & -3\\4x & (+)5\end{pmatrix}$	2	**B1** $6x - 3$ or **B1** $4x + 5$ in a (2 × 1) matrix on answer line
	(b) $(6x^2 + x + 5)$ cao	2	**M1** any 1 × 1 matrix in answer space
14		4	Mark the position of the letter R (or the worst unshaded region if R is missing) as follows 

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15	**(a)** (2, 4)	1	
	(b) (6, 0)	1	
	(c) **(i)** (4, 2) ft	1**ft**	From **(a)** and **(b)**
	(ii) $y = -3x + 14$ oe	2	**M1** sub their **(c)(i)** into $y = -3x + c$ oe
16	$16\frac{1}{4}$ or 16.3	5	**M1** finding the area under graph **A1** 130 **M1** $\frac{1}{2} \times 16 \times v$ **M1** equating and solving
17	**(a)** 201	2	**M1** $\pi \times 8^2$
	(b) 87.9 or 88.0	4	**M1** $\frac{45}{360} \times 2 \times \pi \times 12$ ….. d **M1** $2 \times \pi \times 8$ ……..e **M1 ft** for their (4d + e) which must come from multiples of π **SC2** 43.9 or 44.0
18	**(a)** **(i)** 11	1	
	(ii) $1 - 6x$	2	**M1** $3(1 - 2x) - 2$
	(b) –1.65, 6.65	4	**M1** $\frac{5 \pm k}{2}$ **M1** $\sqrt{[(-5)^2 - 4 \times 1 \times (-11)]}$ or better **A1 A1**
19	**(a)** 6, 30, 70	2	**B1** for 2 correct
	(b) graph	3	**P2** 7 plots correct from table **P1** 5 or 6 plots correct from table **C1** smooth curve through the points in the given range within one small square of the plots or the correct position
	(c) 82.5 or ft ±1	1**ft**	
	(d) 108 or ft ±1	1**ft**	

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