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

0580/21 Paper 21 (Extended), maximum raw mark 70

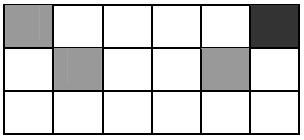
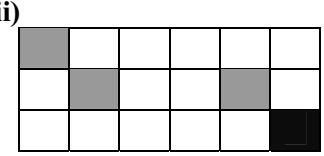
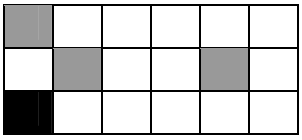
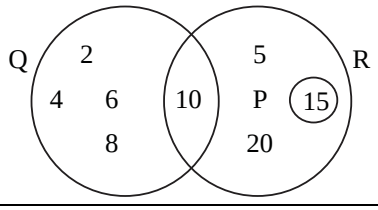
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Mark schemes must be read in conjunction with the question papers and the report on the examination.

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UNIVERSITY of CAMBRIDGE
International Examinations

Qu.	Answers	Mark	Part Marks
1	3.14 π $\frac{22}{7}$ $\sqrt{10}$	2	**M1** 3.1428(…) and 3.16(2…) seen
2	650	2	**M1** $\frac{600}{2.4}$ (× 2.6)
3	44	2	**M1** 97 or 53 seen
4	30	2	**M1** 108 × 1000 / (60 × 60)
5	$3.2(0) \times 10^4$	2	**B1** 32000 or 32×10^3 etc
6	**(a)** 0.461939(…) **(b)** 0.4619 or ft	1 1ft	
7	1.62	3	**M1** $\frac{1}{4}\ \pi\ 0.8^2$ **M1** adding (0.8 × 1.4) to their $k\ \pi$
8	**(a) (i)**  **(ii)**  **(b)** 2	1 1 1	or 
9	Sunday (May) 25 1045	1, 1, 1	Independent
10	24.3(0788…)	3	**M1** 5 × 3.5 + 2 × 1.5 **M1** (√) $1.5^2 + 3.5^2$
11	$\frac{2cw - 4w}{5}$ oe	3	**M1** one correct move to clear fractions **M1** second correct move to subtract term **M1** third correct move dividing by 5 May be in any order
12		3	**M1** 15 only in small circle **M1** 10 only in the intersection **A1** all correct including labels
13	$x = 12$ $y = -10$	3	**M1** consistent addition (& mult) for x or consistent subtraction (& mult) for y **A1** only earned if method correct
14	3.84 or $3\frac{21}{25}$	3	**M1** $y = \frac{k}{x^2}$ oe **A1** $k = 96$

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15	**(a)** 4	1	
	(b) $y = -2x + 9$ oe	3	**M1** $\frac{5-3}{2-3}$ oe **M1** substitution of a point into their equation If **M1** only then **A1**ft for $y =$ "m"$x +$ "c" used correctly with their numeric values
16	**(a)** $\frac{p^3}{8}$ or $0.125p^3$	1, 1	Independent marks for letter and no.
	(b) $\frac{9}{8}q^{-1}$	1, 1	Independent marks for letter and no. Allow $1\frac{1}{8}q^{-1}$ or $\frac{9}{8q}$
17	**(a)** 52	1	
	(b) 64	1	
	(c) 71	2	**M1** angle CED = 19
18	**(a)** E, G	1, 1	
	(b) A, B	1, 1	
19	**(a)** **2p** **3p + q** …….. **5p + 3q** cao	1, 1, 1	
	(b) **(i)** all 4 plotted correctly ft	2	**B1** 2 or 3 correct
	(ii) a (straight) line	1	Allow linear, collinear
20	**(a)** 27	2	**M1** g(–1) = 4 seen or $((x-1)^2-1)^3$
	(b) $9x^2$ cao	2	**M1** $(3x + 1 - 1)^2$ or better
	(c) $\sqrt[3]{x} + 1$	2	**M1** interchange x, y & rearrange formula
21	**(a)** **CB** and **BA** cao	1, 1	Independent
	(b) $\begin{pmatrix} 8 & -24 \\ -4 & 16 \end{pmatrix}$ cao	3	**M1** $\frac{1}{2}\times\frac{1}{4}-\frac{3}{4}\times\frac{1}{8}\left(=\frac{1}{32}\right)$ **M1** $\begin{pmatrix} \frac{1}{4} & -\frac{3}{4} \\ -\frac{1}{8} & \frac{1}{2} \end{pmatrix}$ seen
	(c) determinant is zero	1	Allow cannot divide by zero

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