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

0581 MATHEMATICS

0581/21 Paper 21 (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.

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

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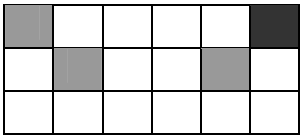
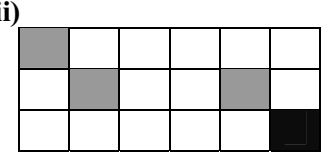
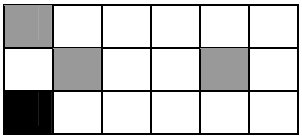
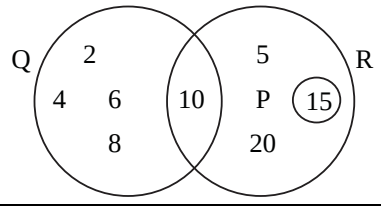
Qu.	Answers	Mark	Part Marks
1	3.14 π $\frac{22}{7}$ √10	2	**M1** 3.1428(…) and 3.16(2…) seen
2	650	2	**M1** $\frac{600}{2.4}$ (× 2.6)
3	44	2	**M1** 97 or 53 seen
4	30	2	**M1** 108 × 1000 / (60 × 60)
5	$3.2(0) \times 10^4$	2	**B1** 32000 or 32×10^3 etc
6	**(a)** 0.461939(…) **(b)** 0.4619 or ft	1 1ft	
7	1.62	3	**M1** $\frac{1}{4}$ π 0.8^2 **M1** adding (0.8 × 1.4) to their k π
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** $k = 96$

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** $\frac{1}{2}\times\frac{1}{4} - \frac{3}{4}\times\frac{1}{8} (= \frac{1}{32})$ **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