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

0580/22 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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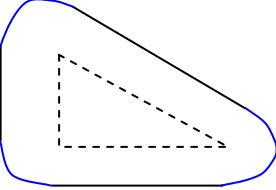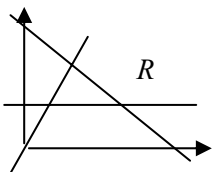
Abbreviations

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	**(a)** 5	1		
	(b) 0	1		
2	10	2	**M1** 33 – 25 or 38 – 30	**M1** 30 – 15 – 5 oe with no further working
3	$m = \dfrac{J}{v - u}$	2	**M1** $m(v - u)$ seen	
4	**(a)** 40	1		
	(b) 65	1		
5	23.6	2	**M1** $\sin R = 20/50$ or $\dfrac{20}{\sin R} = \dfrac{50}{\sin 90}$	
6	**(a)** 6.58×10^{-3}	1	$\times$ and 10 essential	
	(b) 0.00$\underline{66}$ cao	1	Allow 6.6×10^{-3}	
7	$t = 2\dfrac{1}{2}$	2	**M1** **(b)**$t = ($**b**$)(3t - 5)$	
8	Answer given so only working scores marks	2	**M1** 7/27 + 48/27 or 7/27 + (1)21/27 **M1** completely correct finish	
9	2390 2410	2	**M1** 119.5 and 120.5 or **B1** for one correct answer	
10	60	3	**B1** 540 used **M1** [their 540 – 3 × 140]/2	
11	128	3	**M1** $R = kv^2$ **A1** $k = \dfrac{1}{2}$	
12	$\dfrac{x - 7}{(x - 1)(x + 2)}$	3	**M1** $3(x - 1) - 2(x + 2)$ seen **B1** denominator correct seen **A1** all correct	

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13	245 or 246	3	**M1** $\pi \times 5^2$ **M1** 18^2 – their $k\pi$
14		3	**M1** 2 lines correct length **M1** 2 compass arcs correct length **A1** complete accurate drawing with all lines and arcs solid
15	36 cao	3	**M1** 1900/2.448 (= 776.14) **A1** "776.(14…)" – 740 (= 36.14…)
16	**(a)** $\frac{4}{9}x^8$	2	**B1** $\frac{4}{9}$ **B1** x^8
	(b) $2y^{-1}$	2	**B1** 2 **B1** y^{-1}
17	**(a)**	3	**B1** two or three correct or **B2** four or five correct

(a)

	Boys	Girls	Total
Asia	62	28	**90**
Europe	35	45	**80**
Africa	**68**	17	**85**
Total	**165**	**90**	255

17	**(b)** $\frac{3}{17}$ or 0.176(47…)	1	Allow $\frac{45}{255}$, $\frac{15}{85}$, $\frac{9}{51}$
18	**(a)** $\begin{pmatrix} -14 & 0 \\ 0 & -14 \end{pmatrix}$	2	**B1** two or three correct answers
	(b) –14	1	
	(c) $\begin{pmatrix} -5 & 4 \\ 5 & -4 \end{pmatrix}$	2	**B1** two or three terms correct
19	**(a)** 14.1	2	**M1** $(BD^2) = 10^2 + 10^2$ or $\sin 45 = 10/CD$
	(b) 3.74 or 3.78	3	**M1** **(a)**/2 **M1** (their **(a)**/2)^2 + PM^2 = 8^2
20	**(a)**	4	**B1** $y = 2$ **single** line thro **B1** (6, 0) and **B1** (0,6) **B1** $y = 2x$
	(b)	1	Correct R cao

21	**(a)** 2	1	
	(b) 6.7 to 7.3	1	
	(c) 203	3	**M1** intention to find area under the graph **M1** $\frac{1}{2} \times 7 \times 14 + 9 \times 14 + \frac{1}{2} \times 4 \times 14$ oe
22	**(a)** (0, 7)	1	
	(b) (i) $y = 2x + 3$ **(ii)** (1, 4)	2 3	**B1** $y = 2x + c$, $c \neq 7$ or **B1** $y = kx + 3$, $k \neq 0$ **B1** $y = 5$ **M1** $\left(\dfrac{0+2}{2}, \dfrac{3+"5"}{2} \right)$ **A1** (1, ft4)