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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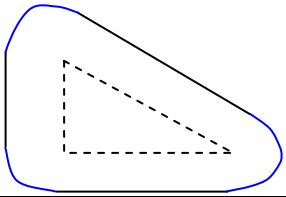
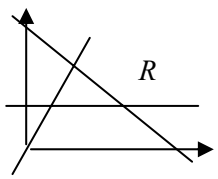
Abbreviations

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 **(b)** 0	1 1		
2	10	2	**M1** 33 – 25 or 38 – 30	**M1** 30 – 15 – 5 oe with no further working
3	$m = \frac{J}{v-u}$	2	**M1** $m(v-u)$ seen	
4	**(a)** 40 **(b)** 65	1 1		
5	23.6	2	**M1** $\sin R = 20/50$ or $\frac{20}{\sin R} = \frac{50}{\sin 90}$	
6	**(a)** 6.58×10^{-3} **(b)** 0.00<u>66</u> cao	1 1	× and 10 essential Allow 6.6×10^{-3}	
7	$t = 2\frac{1}{2}$	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** $k = \frac{1}{2}$	
12	$\frac{x-7}{(x-1)(x+2)}$	3	**M1** $3(x-1) - 2(x+2)$ seen **B1** denominator correct seen **A1** all correct	

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)** Boys / Girls / Total Asia 62 28 **90** Europe 35 45 **80** Africa **68** 17 **85** Total **165** **90** 255	3	**B1** two or three correct or **B2** four or five correct
	(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 sin45 = 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)** $y = 2x + 3$	2	**B1** $y = 2x + c$, $c \neq 7$ or **B1** $y = kx + 3$, $k \neq 0$
	(ii) (1, 4)	3	**B1** $y = 5$ **M1** $\left(\frac{0+2}{2}, \frac{3+"5"}{2}\right)$ **A1** (1, ft4)