UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2007 question paper

0580 and 0581 MATHEMATICS

0580/02 and 0581/02 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.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

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

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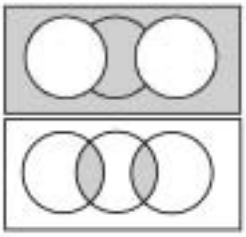
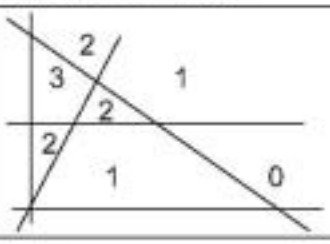
International Examinations

* indicates that it is necessary to look in the working following a wrong answer

1	(a) 4 (b) 4	1 1	
2	(a) 0.176 (b) 1.76×10^{-1}	1 1√	ft their answer to (a)
3	0.512 or 64/125	2*	**M1** 0.8 x 0.8 x 0.8 leading to answer
4	tan100 , cos100, sin100	2*	**M1** for correct conversion to decimals - 5.67, - 0.174, 0.985 2sf or better **SC1** all correct but reversed
5	(a) 1/50 (b) 4.35	1 1	**cao** Allow fraction
6	135 165 **cao**	1,1	**SC1** 2h 15m **and** 2h 45m or 2.25 **and** 2.75 or 135 **and** 165 reversed or 4.5 **and** 5.5 seen
7	$\begin{pmatrix} 13 & 21 \\ 21 & 34 \end{pmatrix}$	2	**W1** for 13, 21 **W1** for 21, 34
8		1 1	
9	(a) any non square √ or π or e (b) 61 or 67	1 1	√5 but not √9. √2/3 is OK, sin20 etc but not sin30 No fractions, decimals or root of negatives allow 61 **and** 67 but no other pairs
10	$\frac{x^2 - 6x + 25}{4(x - 3)}$	3*	**M1** $x^2 - 6x + 9$ **M1** denom 4(x - 3) or 4x -12 seen
11	(a) $x^2 - 16$ **cao** (b) 5 and –5 **www**	1 2*	allow $(x - 4)(x + 4)$ **M1**√ (a) = 9 and one correct completed operation
12			Mark **unshaded** region **SC1** correct region shaded and no label **SC2** correct region shaded and labelled
13	108	3*	**M1** $y = k(x + 2)^3$ **A1** k = 4 or **M1** $y_1 / y^2 = x_1^3 / x_2^3$ **A1** $y_1 / 32 = 27/8$

* indicates that it is necessary to look in the working following a wrong answer

14	7.31	3*	**M1** cos70 = 3.8/ (3.8 + x) **M1** 1.3 + 0.342x = 3.8 **M1** y/sin70 = 7.6/sin40 **M1** x = "11.11" – 3.8	**M1** cos70 = 3.8 /y **M1** x = "11.11" – 3.8 **M1** cos rule **M1** 1.3 + 0.342x = 3.8
15	(a) 12/18 oe (b) 3/12 oe	1 2*	allow 0.667 or better **W1** numerator 3 < **W1** denominator 12 If B0, mark final fraction before cancellation	
16	(a) x **cao** (b) 9x - 4	1 2*	 **M1** 3(3x – 1) - 1	
17	(a) 5/2 or 2.5 (b) –1	2* 2*	**M1** 2^5 or $2^{5/2}$ **M1** 2^{-3} or $(1/8)^{1/3}$ or 2^{-1} (or ½ in correct context)	(b) **SC1** -3/3
18	(a) $\frac{8 - 3x}{2}$ or 4 - 1.5x oe (b) - 3/2 or -1.5 (c) (0, 4)	2* 1√ 1√	**M1** any 2 operations completed correctly **SC1** (3x – 8)/ -2 from their equation in (a) from their equation in (a)	
19	(a) w = 26 x = 128 (b) y = 52√ from incorrect x [y= 52√ **but** no working scores **B1**]	1,1 2*	 **E1** convincing explanation eg involving their x, OQT = OPT = 90 and angles in a quadrilateral	
20	Accurate perpendicular bisector of AB through P by construction **[a correct line goes throughP- no daylight]** circle centre D radius 3cm ± 1mm 320 to 332	2* 1 1	**M1** two sets of correct arcs and a line joining or **M1** one set of correct arcs and a line through P. **A1** accurate line 2.4cm ± 1mm from A or B **W1** no arcs, accurate line 2.4cm ± 1mm from A or B Must be a complete circle but can be dotted	
21	(a) 0.6 or 3/5 (b) 1170	1 3*	Allow 2.16 km/h^2 provided units stated **M1** one area based on t axis + one other correct **M1** for finding the total area under the graph	
22	(a) 2300 (b) 8.64	2* 3*	**M1** 5 x 2000 x 3 ÷ 100 **M1** 2000 x 1.049^3 oe (2098, 2200.80, 2308.64) **dep M1** (for C I method) subtraction of (a)	
23	(a) 14.1 **www** (b) 24.8	4* 2*	**W1** r = 3 **M1** ½ x π x 6^2 dep **M1** - π x 3^2 (or ¼ x π x 6^2 **and** then -½ x π x 3^2) [**SC1** for ½ x π x 12^2 **and dep SC1** - π x 6^2] **M1** ¼ x 2x πx 6 + ½ x 2x π x 3 [**SC1** ¼ x 2x π x 12 + ½ x 2x π x 6]	
	TOTAL	**70**		