UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the May/June 2012 question paper

for the guidance of teachers

4024 MATHEMATICS (SYLLABUS D)

4024/11 Paper 1, maximum raw mark 80

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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UNIVERSITY of CAMBRIDGE
International Examinations

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
soi seen or implied

Qu		Answers	Mark	Part Marks
1	**(a)**	The correct diagram	1	
	(b)	A correct diagram	1	
2	**(a)**	– 9	1	
	(b)	103	1	
3	**(a)**	18.75 (accept 15 to 20)	1	
	(b)	arrow between $\frac{3}{4}$ and $\frac{7}{8}$	1	
4	**(a)**	$3x^2(4 - 5x)$	1	
	(b)	$(x - 3)(x + 2)$ oe Final ans.	1	
5	**(a)**	4.25	1	
	(b)	2.6	1ft	ft 6.85 – their(a)
6		0.0013	2	**B1** for $\frac{22}{7}$ = 3.14285 or better or 3.14286
7	**(a)**	48	1	
	(b)	72	1	
8		$m = 9$ $n = 11$	2	**B1** for either $m = 9$ or $n = 11$
9		14 30	2	**B1** for 90 seen or **M1** for an attempt to find a common multiple
10		$x = 5$ $y = -3$	3	**C2** for one correct with working and www **M1** for a correct method to eliminate one variable

11	**(a)**	$\frac{11}{35}$ oe isw	1	
	(b)	$\frac{20}{21}$ oe isw	2	**B1** for $\frac{5}{3}$ and $\frac{7}{4}$ (or $\frac{4}{7}$) seen
12	**(a)**	2	1	
	(b)	8	1	
	(c)	$\sqrt{2}$	1	
13	**(a)**	64	1	
	(b) (i)	(0)9 50	1	
	(ii)	1.28 oe isw	1	
14	**(a)**	$\frac{6}{20}$ oe isw	1	
	(b)	$\frac{11}{20}$ oe isw	2	**M1** for $(1-\frac{3}{4})\times(1-\frac{3}{5})+\frac{3}{4}\times\frac{3}{5}$
15	**(a)**	2^9	1	
	(b)	44	2	**B1** for 3×2^4 or 2^2 soi or $2^{10}(2^2\times 9-3)$
16	**(a)**	60	1	
	(b)	20.7	2	**M1** for their 18 × (1).15 oe
17	**(a)**	4×10^{10}	1	
	(b)	5.6×10^8	2	**C1** for 56×10^7 oe or **M1** for figs 56 or their grams ÷ 1000
18	**(a)**	$\frac{3}{5}$ oe	1	
	(b)	$(y)\geqslant 2$	1	
	(c)	$\frac{7}{10}$ oe	2	**M1** for $3(2t-1)=4(1-t)$ soi or for both $6t-3$ and $4-4t$ seen
19	**(a)**	Table completed correctly	1	
	(b)	n^2	1	
	(c)	n^2-n oe	1	
	(d)	780	1	

20 **(a)**	1 3	1	
(b)	1 4	1	
(c)	2	1	
(d)	(–1, 3) oe	1	
21 **(a)** **(i)**	15	1	
(ii)	27	2	**B1** for either 35 × 0.6 or 5 × 1.2 oe seen
(b)	54	1ft	ft their(a) × 3.6 if less than 360
22 **(a)**	$\frac{24}{11}$ oe isw	2	**M1** for $\frac{1}{b} = \frac{11}{24}$
(b)	$\frac{bc}{c-b}$ oe	3	**M1** for $\frac{1}{b} = \frac{c+d}{cd}$ or $\frac{1}{d} = \frac{1}{b} - \frac{1}{c}$ or $cd = bd + bc$ **M1** for $cd - bd = bc$ or $\frac{1}{d} = \frac{c-b}{bc}$ After one of the **M1**'s earned, allow **A1** ft for a correct conclusion from the second **M** stage.
23 **(a)**	1.5 oe	1	
(b)	0.7 – 1	2	Dependent on a tangent drawn. **M1** for tangent drawn at t = 8
(c)	570	2	**B1** for (48 – 15) × 15 or ½ × 15 × (58 – 48) or ½(48 – 15) × 15 or ½(58 – 15) × 15
24 **(a)**	Similar triangles justified	2	**B1** for $BAX = AYD$ or $DAY = AXB$ (Alternate) or for $ABX = ADY$ (opposite in parallelogram)
(b)	10.5 oe	2	**B1** for $\frac{12}{8}$ or $\frac{8}{12}$ soi
(c)	3	2	**M1** for $\frac{CX}{9} = \frac{4}{12}$ or $\frac{CX}{9-CX} = \frac{4}{8}$ oe or **B1** for $BX = \frac{9 \times 8}{12}$
25 **(a)** **(i)**	25	1	
(ii)	10	1	
(iii)	$\frac{2}{3}$ $-\frac{1}{2}$	2	**M1** for $6x^2 - x + 3 = 5$ or better seen
(b)	$6a^2 + 11a + 8$	2	**M1** for $6(a+1)^2 - (a+1) + 3$ seen