CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the May/June 2013 series

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.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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CAMBRIDGE
International Examinations

Qu		Answers	Mark	Part Marks
1	(a)	100	1	
	(b)	475	1	
2	(a)	0.06 oe	1	
	(b)	50	1	
3	(a)	3.556	1	
	(b)	12000	1	
4	(a)	<	1	
	(b)	(0) . 07	1	
5		16	2	B1 for PX or XQ = 8 or M1 for $PX^2 = 10^2 - 6^2$ oe
6		$\frac{7}{20}$ oe isw	2	B1 for $\frac{8+5}{20}$ oe seen
7		1 : 60 000	2	C1 for 1 : figs 6 or M1 for 4.5 : 270 000 oe
8	(a)	148 soi	1	
	(b)	$-\frac{12}{13}$	1	
9	(a)	18	1	
	(b)	90	2	M1 for x - $\frac{10}{100}x = 81$ or better or B1 for figs $\frac{81}{9}$ seen
10	(a)	55	1	
	(b)	$\frac{ma-b}{m}$ oe	2	M1 for $b = ma - mc$ or $\frac{b}{m} = a - c$ B1 ft for their c after M0
11	(a)	square	1	
	(b)	trapezium	1	
	(c)	kite	1	

12	**(a)**	619	1	
	(b)	196	1	
	(c)	169, 196 or 961	1	
13	**(a)**	25	2	M1 for a correct area
	(b)	1.25 oe	1	Accept $\frac{(a)}{20}$ ft
14	**(a)**	32°	1	
	(b)	26°	1	Accept 90 – ((a) + 32
	(c)	58°	1	Accept 90 – $\frac{1}{2}$((a) + 32)
15	**(a)** **(i)**	Bisector of $A\hat{D}C$	1	
	(ii)	Arc radius 5 centre *B*.	1	
	(b)	Correct region shaded.	1	
16	**(a)**	4	1	
	(b)	5400	2	C1 for figs 54 M1 for $2^3 : 3^3$ seen in any form.
17	**(a)**	6.24×10^3	1	
	(b)	8×10^{-2}	2	C1 for figs 8 or for any correct value however expressed.
18	**(a)**	30	1	
	(b)	66	1	
	(c)	30	2	M1 for an attempt at 78 – 48.
19	**(a)**	$\frac{7\pi}{9}$	2	M1 for $\frac{40}{360}\pi r^2$
	(b) **(i)**	$6\frac{2}{3}\pi$	1	
	(ii)	$\frac{11}{15}$	1	

20	**(a) (i)**	26	1	
	(ii)	6	1	
	(iii)	16	1	
	(b)	– 2	1	
21	**(a)**	(R =) $3p^3$ seen	1	
	(b)	4	2	M1 for $192 = 3p^3$ oe
	(c)	(Diagram) 2	1	
22	**(a)**	Correct triangle C	1	
	(b)	Correct triangle D	2	C1 for two vertices correct or for triangle of the correct size and orientation.
	(c)	$\begin{pmatrix} 1 & 0 \\ 0 & 3 \end{pmatrix}$	1	
23	**(a) (i)**	$\frac{4}{6}$ oe	1	
	(ii)	e.g. $y = \frac{4}{6}x + 3$ oe	1	
	(iii)	$y = 3x + 2$	1	
	(b)	$y \geq 2$ $y \leq \frac{4}{6}x + 2$	2	C1 for one of these.
24	**(a) (i)**	$\begin{pmatrix} 6 & 9 \\ 1 & 3 \end{pmatrix}$	1	
	(ii)	$\frac{1}{5}\begin{pmatrix} 1 & 3 \\ -1 & 2 \end{pmatrix}$	2	B1 for det = 5 soi or for $k\begin{pmatrix} 1 & 3 \\ -1 & 2 \end{pmatrix}$
	(b)	1, 2, 3,4,6,8,12	2	B1 for 5 correct with no extras
	(c)	$M' \cap N$	1	

25	**(a)**	$5xy(2x + 3y)$	1	
	(b)	$(5a - b)(5a + b)$	1	
	(c)	$\frac{1-2x}{(x+1)^2}$ Final Answer	2	M1 for $\frac{3-2(x+1)}{(x+1)^2}$ oe
	(d)	$\frac{ab}{6}$	2	C1 for any 2 terms correct M1 for $\frac{3a^2}{10bc} \times \frac{5b^2c}{9a}$ soi