CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the May/June 2014 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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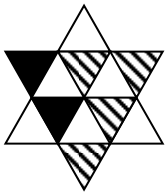
International Examinations

Question	Answers	Mark	Part Marks
1 (a)	correct shape	1	
(b)		1	
2 (a)	5.3	1	
(b)	90	1	
3 (a)	29.2	1	
(b)	38.7	1	
4	obtuse angled	2	**M1** for $5^2 + 7^2$ (= 74)
5 (a)	$\geqslant$ 5 oe	1	
(b)	–2, –1, 0, 1	1	
6 (a)	45 (°)	1	
(b)	27	1	
7	$a = 10.05$ $b = 14 / 3$ oe	2	**B1** for either or **M1** for $\frac{280}{360} \times 2\pi \times 3$
8 (a)	8	2	**M1** for two of 30, 50, 0.5, 20 seen
(b)	(0).32	1	
9	$\frac{3y+4}{y+1}$	3	**M1** for $y(3 - a) = a - 4$ soi and a further **M1** for $3y + 4 = a + ay$ soi
10 (a)	–4	1	
(b) (i)	[0]8 18	1	
(ii)	33	1	
11 (a)	180 [°]	1	
(b)	220 [°]	1	
(c)	285 [°] cao	1	

12 **(a)**	$4n + 3$ oe	1	
(b)	5 29	2	**B1** for either
13 **(a)**	3	1	
(b) **(i)**	x^5	1	
(ii)	$\frac{2}{3a}$	1	
14 **(a)** **(i)**	15	1	
(ii)	12	1	
(b)	Column, F.D. 1.2 width 50 to 65	1	
15 **(a)**	10 etc.	1	
(b)	0	1	
(c)	$\sqrt{50}$ etc.	1	
16 **(a)**	38 [°]	1	
(b)	57 [°]	1	
(c)	85 [°]	1 ft	
17 **(a)** **(i)**	$8t + 17$	1	
(ii)	$2p + 13q$	1	
(b)	$5x^2y(5xy - 3)$	1	
18 **(a)**	[0].12	1	
(b)	Blue 36	3	**M2** for the difference between ½60 × 8 and [½30 × 6 + 20 × 6 +½10(6 + 7.2) oe or **M1** for using area under graph.
19 **(a)**	2×10^{-5}	2	**B1** for 2000×10^{-8} or **M1** for figs $\frac{6}{3}$ soi
(b)	2.99×10^{-23}	2	**B1** for figs 299 or better

20	**(a)**	7 – 9	2	**B1** for either or **M1** for using $x^2 - 2ax + a^2 + b$ or $(x - 7)^2 + k$ seen.
	(b)	$\frac{2}{3}$ $\quad -3$	2	**M1** for framework $(3x + h)(x + k)$ seen.
21	**(a)** **(i)**	(0, 3) (2, 0)	2	**B1** for either or **M1** for substituting 0 for either x or y
	(ii)	$-\frac{3}{2}$ oe	1	
	(b)	(–1, 9)	1	
22	**(a)**	Correct triangle	1	
	(b) **(i)**	Perpendicular bisector of AC	1	
	(ii)	Arc centre A radius 4 cm	1	
	(c)	Correct region shaded	1	
23	**(a)**	17	2	**M1** for $(1 : 3)^2$ soi
	(b)	$\frac{72}{125}$ oe	3	**M1** for $y = \frac{k}{x^3}$ and **A1** for $k = 72$
24	**(a)**	$\frac{3}{9}, \frac{6}{9}, \frac{4}{9}$ $\frac{5}{9}$ oe	2	**B1** for three correct
	(b) **(i)**	$\frac{12}{90}$ oe	1FT	FT from *their* tree diagram
	(ii)	$\frac{48}{90}$ oe	2FT	FT from *their* tree diagram **B1** for $\frac{24}{90}$ oe FT seen or **M1** for $\frac{4}{10}\times\frac{6}{9}+\frac{6}{10}\times\frac{4}{9}$ oe FT
25	**(a)**	$\begin{pmatrix} 4 & -6 \\ -6 & 14 \end{pmatrix}$	2	**B1** for three elements correct.
	(b)	$\begin{pmatrix} 11 & -7 \\ -14 & 18 \end{pmatrix}$	2	**B1** for three elements correct

(c)	$\frac{1}{10}\begin{pmatrix} 4 & 1 \\ 2 & 3 \end{pmatrix}$	2	**B1** for (det A =) 10 seen or implied or For $\begin{pmatrix} 4 & 1 \\ 2 & 3 \end{pmatrix}$ seen or **M1** for $4 \times 3 - (-2 \times -1)$