CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the October/November 2012 series

4024 MATHEMATICS (SYLLABUS D)

4024/11   Paper 1, maximum raw mark 80

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

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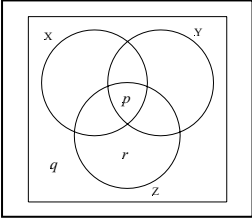
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Question		Answers	Mark	Part marks
1	(a)	$\dfrac{17}{30}$ oe	1	
	(b)	$\dfrac{8}{45}$ oe	1	
2	(a)	0.76 oe	1	
	(b)	15	1	
3	(a)	120	1	
	(b)	16	1	
4		220 $2\dfrac{1}{4}$ 2300 0.021	2	**C1** for 3 correct when one is covered or **C1** for reversed answer
5	(a)	21 30 or (0) 9 30 p.m. only	1	
	(b)	338 (.0) (0)	1	
6	(a)	3.4×10^{-5}	1	
	(b)	$2 (.0) \times 10^{16}$	1	
7	(a)	5 cao	1	
	(b)	0.17	1	
8		42	2	**B1** for 120 or 168 seen
9		28	2	**B1** for $k = 4$ or **B1** for $\dfrac{1}{5} \times 20 = y \times \dfrac{1}{7}$ oe
10	(a)	135	1	
	(b)	195	1	
11	(a)	3	1	
	(b)	2.5	1	
12	(a)	$\left(\dfrac{1}{4} \text{ and } \dfrac{3}{4}\right)$; (0 and 1); $\left(\dfrac{1}{3} \text{ and } \dfrac{2}{3}\right)$ – all three pairs	2	**B1** for any one pair
	(b)	$\dfrac{1}{4}$ oe	1	

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13	(a)	1.5	1	
	(b)	8.4	2	**B1** for (figs 345×20), or for figs 69

14	(a)	**(i)** 6	1	
		(ii) $\dfrac{9}{16}$	1	
	(b)	$8x^6$ cao	1	

15	(a)	36	1	
	(b)	28	1	
	(c)	112 or 4 × their **(b)**	1 ✓	

16	(a)	$\begin{pmatrix} \frac{1}{3} & 0 \\ 0 & 1 \end{pmatrix}$ or $\frac{1}{3}\begin{pmatrix} 1 & 0 \\ 0 & 3 \end{pmatrix}$ oe	1	
	(b)	(one way) stretch	1	
		parallel to x-axis / y-axis invariant **and** (stretch/scale) factor 3	1 dep	

17	(a)	$x > 1$	1	**C1** for the two correct lines with wrong
		$x + y < 9$	1	inequality symbols
	(b)	10	1	

18	(a)	$5p(4 + 5p)$	1	
	(b)	$(3 - 2t)(3 + 2t)$	1	
	(c)	$(9 - x)(1 + 4x)$ or $(x - 9)(-4x - 1)$	1	

19		720 or 540	**B1**	
		$10x = their$ (720) or $5x + their$ (180) $= their$ (540)	**M1**	
		72	**A1**	Ans. of 72 WW scores 2.

20	(a)	$2x - 3$	1	
	(b)	$A = -\frac{3}{2}$ oe	1	**B1** for $\dfrac{-9 + 3}{2} + \dfrac{t + 3}{2}$ oe
		$B = \frac{1}{2}$ oe	1	or **B1** for f(–9) = –3 cao

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21	(a)	7	**1**	
	(b)	correct *p*	**1**	
		correct *q*	**1**	
		correct *r*	**1**	
22	(a)	68	**1**	
	(b)	52	**1**	
	(c)	56	**1**	
	(d)	72	**1**	
23	(a)	(–) 2	**1**	
	(b)	20	**1**	
	(c)	600	**1**	
	(d)	40 or 10 + 30 × | *their* (a) | / 2	**1**✓	
24	(a)	(3, 5)	**1**	
	(b)	(i) (4, 6)	**1**	
		(ii) 29 or (*their* C_x + 1)^2 + (*their* C_y – 8)^2	**2**✓	**M1** for numerical $\overrightarrow{AB} + \overrightarrow{BC} = \overrightarrow{AC}$ or **B1** for $(\overrightarrow{AC} =) \begin{pmatrix} 5 \\ -2 \end{pmatrix}$
25	(a)	3*n* – 2 (3*n* – 1) 3*n*	**1**	
	(b)	(i) 121 and 120	**1**	
		(ii) 3*n* (3*n* – 2) oe or f.t from *their* (a) response provided it is in terms of *n*.	**1**✓	
		(iii) (3*n* – 1)^2 – 3*n* (3*n* – 2)	**M1**	
		correctly reaching 1	**A1**	If [0] scored then award **B1** for (3*n* – 1)^2 or for $9n^2 – 6n + 1$ seen and used

26	(a)	264° to 268° inclusive	1	
	(b)	Acceptable quadrilateral *ABCD*	1	
	(c)	(i) acceptable perp. bisector of *AB*	1	
		(ii) acceptable bisector of angle *ABC*	1	
	(d)	correct region (top l.h. corner) shaded	1	dep. on two reasonably accurate intersecting lines
27	(a)	$\begin{pmatrix} -3 & -1 \\ -2 & -1 \end{pmatrix}$ cao	2	**C1** for 2 or 3 elements correct
	(b)	(i) 1 row 2 columns	1	
		(ii) (4 3)	2	**C1** for (4p 3p) or for $\begin{pmatrix} 4 \\ 3 \end{pmatrix}$ or **B1** for (2x – x + 3y) or **M1** for x = $k\begin{pmatrix} 8 & 5 \end{pmatrix}\begin{pmatrix} 3 & 1 \\ 0 & 2 \end{pmatrix}$