

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the October/November 2014 series

4024 MATHEMATICS (SYLLABUS D)

4024/12

Paper 1, maximum raw mark 80

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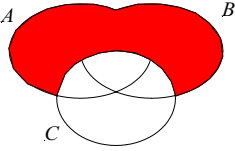
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Abbreviations

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

Question	Answers	Mark	Part marks
1 (a)	5.11 oe	1	
(b)	2 hours and 35 minutes	1	
2 (a)	59	1	
(b)	$T = \frac{13M}{500} + 20$ oe seen	1	
3 (a)	-0.5	1	
(b)	0.1	1	
4 (a)	-5	1	
(b)	$\frac{x+6}{2}$ oe	1	
5 (a)	1200 cao	1	
(b)	3	1	
6 (a)	Correct region shaded	1	
(b)	3	1	
7	25	2	C1 for figs. 25 or M1 for $\frac{\text{figs } 9}{60 \times 60}$ oe
8 (a)	1 : 2 oe	1	
(b)	1 : 8 oe, or ft <i>their(a)</i> cubed	1 ^{ft}	

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9	(a) 54.25	1	
	(b) $\frac{d+0.5}{54.25}$, or ft $\frac{d+0.5}{their(a)}$, seen	1 ^{1/2}	
10	12	2	B1 for “k” = 72 or M1 for $9 \times 8 = 6y$ oe or M1 for $y = (their\ k)/6$ when $y =$ “k”/x used
11	(a) 1	1	
	(b) 41 40 81 (all three)	1	
	(c) $(2n + 1)^2$ oe	1	
12	(a) 5.67×10^{-4}	1	
	(b) 6×10^{-12}	2	C1 for figs 6, or for the index –12
13	(a) 140	1	
	(b) 1.2	2	M1 for $3 \times \left(\frac{7}{5} - 1\right)$; or $3 \times \left(\frac{their(a)}{100} - 1\right)$; oe or a complete algebraic method.
14	(a) 10	1	
	(b) 216	2	M1 for $\pi \times 6 \times 10 = \frac{x}{360} \times \pi r^2$ or $2 \times \pi \times 6 = \frac{x}{360} \times 2\pi r$ where $r = 10$ or <i>their(a)</i> . Where radians are used, method must include multiplication by $\frac{180}{\pi}$.
15	(a) 720	1	
	(b) 20	2	M1 for $(\pi \times 62 \times d)$ (oe) = $k\pi$ where $k = 720$ or <i>their(a)</i>

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16	(a)	$\begin{pmatrix} -4 \\ -3 \end{pmatrix}$	1	
	(b)	$\begin{pmatrix} -3 \\ -4 \end{pmatrix}$	1	
	(c)	5 cao	1	
17	(a)	$p^5 - 3$	2	B1 for p^5 , or for -3 .
	(b)	$3x^2$	2	C1 for 3; C1 for x^2
18	(a)	$4a(1 - 4a)$	1	B1 for one of the partial factorisations $x(x - y)$; $5(x - y)$; $x(x + 5)$; $y(x + 5)$, or their negatives.
	(b)	$(3b - c)(3b + c)$	1	
	(c)	$(x + 5)(x - y)$	2	
19	(a)	4	1	<p>If [0] earned for the two 150s, award M1 for</p> <p>using 360° correctly in a quadrilateral, or for using 540° correctly in a pentagon, or for using 720° correctly in a hexagon, to find the 135.</p> <p>If [0] earned in (b), then B1 for (angle sum of a hexagon equals) 720° seen.</p>
	(b)	90°	1	
		two 150° } correctly obtained	1	
		two 135° } correctly obtained	1	

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20	(a)	68	1	
	(b)	44	1	
	(c)	112 or ft 180 – <i>their</i> (a)	1 ^{ft}	
	(d)	44 or ft <i>their</i> (b)	1 ^{ft}	
21	(a)	Correct completion of tree diagram	1	
	(b)	(i) $\frac{1}{10}$ (ii) $\frac{17}{50}$ or ft from <i>their</i> tree diagram	1 2 ^{ft}	M1 for $\left\{\frac{2}{5} \times \frac{1}{4} \text{ or } \textit{their}(bi)\right\} + \frac{3}{5} \times \textit{their}\left(\frac{2}{5}\right)$
22	(a)	1.2	1	
	(b)	3.6	1	
	(c)	480	2	M1 for $\frac{1}{2} \times (20 + 60) \times 12$ oe or B1 for 180, or 240, or 60, or 420, or 300, as a correct evaluation of an identifiable appropriate area.
23	(a)	(8, 10)	1	
	(b)	$x > 8$ oe $2y > 12 + x$ oe	1 1	If 0 scored, then C1 for $x \geq 8$ oe and $2y \geq 12 + x$ oe.
	(c)	(9, 11)	1	
24	(a)	137° to 140° inclusive	1	
	(b)	(i) perp. bisector of AB	1	
		(ii) circle, centre C , radius 4 cm	1	
		(iii) correct region (bottom part) shaded	1	

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25	(a)	$\left(-\frac{1}{2}, 1\right)$	1	C1 for one correct coordinate	
	(b)	$-\frac{6}{7}$	1		
	(c)	(i)	(10, -8)		2
		(ii)	$\frac{1}{3}$		1
26	(a)	$\frac{1}{7}$	1	C1 for 2 or 3 correct elements. M1 for $(Y =) (6 \ 2) A^{-1}$ seen. If $(x \ y) A = (6 \ 2)$ is used, then award M1 at the stage where an attempt to solve the simultaneous eqns. is made.	
	(b)	$\begin{pmatrix} -1 & -4 \\ 2 & 0 \end{pmatrix}$	2		
	(c)	(2 0), or (14 × <i>their</i> (a) 0) ft	2 ^{1/2}		