Cambridge
O Level

Cambridge International Examinations
Cambridge Ordinary Level

MATHEMATICS (SYLLABUS D) **4024/11**

Paper 1 **May/June 2016**

MARK SCHEME

Maximum Mark: 80

Published

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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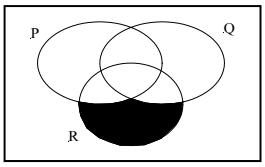
Question	Answers	Mark	Part marks
1 (a)	14	1	
(b)	(0).45(0)	1	
2 (a)	$\frac{1}{24}$ oe	1	
(b)	$\frac{3}{7}$ cao	1	
3 (a)	02 25	1	
(b)	3150	1	
4	530	2 *	**B1** for (1800 and 1270); or for 370 or 530 seen
5	88	2 *	**M1** for (4 × 80 + 120), or better.
6 (a)	3.4×10^{-5}	1	
(b)	0.42×10^{-5} 33.7×10^{-6} 0.034×10^{-3}	1	Accept *correct* equivs.
7	30; 8; 0.4 all three	**M1***	**B1** for two of 30; 8; 0.4
	600	**A1**	Ans. 600 ww, award **C1**
8 (a)	Acceptable kite	1	
(b)	Acceptable parallelogram	1	
9	$y \leqslant 3$ oe $y \geqslant -x$ oe	1 1	**C1** for y ... 3 oe and y ... $-x$ oe, where '...' is the wrong inequality or =
10	$(x - 4)(3y + 5)$	2 *	**B1** for $5(x - 4)$, or $3y(x - 4)$, or $x(3y + 5)$, or $4(3y + 5)$.
11 (a)	$-10\frac{1}{2}$ oe	1	
(b)	6	2 *	**B1** for $3 = 2$ 'x' $- 9$ or for $\frac{x+9}{2}$ or $\frac{y+9}{2}$
12 (a)	3.6 oe	1	
(b)	25	1	
(c)	1:250 000	1	

Question	Answers	Mark	Part marks
13	A correct method to eliminate one variable. Both $x = -2$ and $y = -1.5$ www;	* **M1** **A2**	 Or **A1** for one correct or ft their value of x or y correctly evaluated in one equation For y, accept –1.5, or $-1\frac{1}{2}$, or $-\frac{3}{2}$, only. If [0] earned, then **C1** for a pair of values that satisfy either equation
14	Vol. of hemisphere = $\frac{2}{3}\times\pi\times3^3$ oe or 18π Vol. of cone = $\frac{1}{3}\times\pi\times3^2\times2$ or 6π $k = 12$	**M1*** **M1*** **A1**	
15 (a)	4.5 oe	2 *	**M1** for $8 = k4^2$ oe or $8 \div 4^2 = y \div 3^2$ oe
(b)	7.5 or any equiv.	1	
16 (a)	10°	1	
(b)	20°	1	
(c)	60°	1	
17 (a)	10, 12	1	
(b)	$2n + 2$	1	
(c)	99	2 *	**M1** for *their* (b) = 200
18 (a)	Vertical axis label should be 'Frequency density' or heights should be 3, 8, 10, 2.	1	
(b)	Rectangles with same bases as in (a), with heights 3, 8, 10, 2. Vertical label 'Frequency density' and a suitable scale.	3 *	**C2** for 4 bars correct, with no label or incorrect scale on vertical axis or for 3 bars correct with 'Frequency density' label and numbered linear scale. **C1** for numbers 3, 8, 10, 2; or 'Frequency density' label or for 3 bars correct
19 (a)	40°	1	
(b)	140°	1	

Question	Answers	Mark	Part marks
(c)	50°	1	
(d)	40°	1	
20 (a)	0	1	
(b)	1	1	
(c)	1.6 oe	2*	**M1** for $(11 \times 1 + 9 \times 2 + 7 \times 3 + 6 \times 4 + 1 \times 6)/50$
21 (a)	$2^2 \times 5^3$	1	
(b) (i)	$p = 5$ and $q = 4$	1	
(ii)	$p = -3$ and $q = 0$	1	
(iii)	$p = 8$ and $q = 4$	1	
22 (a)	101° to 103°	1	
(b) (i)	Circular arc, centre B, radius 4 cm.	1	
(ii)	Line parallel to AC, 2 cm away.	1	
(c)	$AP = 6.2$ to 6.6 cm	1	
23 (a)		1	
(b) (i)	24	1	
(ii)	8	1	
(iii)	22 or 26 or 30	1	
24 (a) (i)	$\frac{20}{T}$ oe	1	
(ii)	5	1	
(b) (i)	15	1	
(ii)	Curve, concave down, from (0, 0) to (T, 150)	1	
25 (a) (i)	$\mathbf{p} - \mathbf{q}$	1	
(ii)	$3\mathbf{p} - 4\mathbf{q}$	1	

Question	Answers	Mark	Part marks
(iii)	$9\mathbf{p} - 9\mathbf{q}$	2 *	**B1** ft for a correct unsimplified form seen or correct route seen
(b)	1:8	1	
26 (a) (i)	0	1	
(ii)	$\frac{3}{7}$	1	
(b)	$\frac{2}{7}$ oe	1	
(c)	$\frac{11}{14}$ oe	2*	**M1** for $\frac{1}{2}\times 1 + \frac{1}{2}\times\frac{4}{7}$