Cambridge O Level

Cambridge Assessment International Education
Cambridge Ordinary Level

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

Paper 1 **October/November 2017**

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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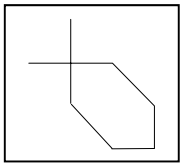
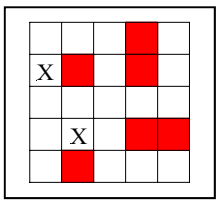
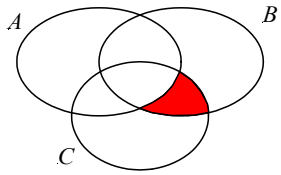
Abbreviations

cao	correct answer only
dep	dependent
FT	follow through after error
isw	ignore subsequent working
oe	or equivalent
SC	Special Case
nfww	not from wrong working
soi	seen or implied

Question	Answer	Marks	Partial Marks
1(a)	$\frac{17}{24}$	**1**	
1(b)	0.52	**1**	
2(a)	80	**1**	
2(b)	$(\pm)\frac{1}{3}$	**1**	
3(a)	24	**1**	
3(b)	120	**1**	
4	Initial statement containing 1000 and 0.02	**M1**	If M0, award **C1** for 50 000 nfww.
	50 000	**A1**	
5(a)		**1**	
5(b)		**1**	
6	11	**2**	**M1** for $1\frac{1}{2} \times 10 + 7$
7(a)	16.6	**1**	
7(b)	$\frac{x-7}{3}$ oe	**1**	

Question	Answer	Marks	Partial Marks
8	80	**2**	**B1** for "k" = $\frac{4}{5}$ if y = "k"× x^2 used or **M1** for $\frac{\frac{1}{5}}{\left(\frac{1}{2}\right)^2} = \frac{y}{10^2}$ oe or FT **M1** for y = (*their k*) × 100 when y = "k" × x^2 used
9(a)	$x > 4$	**1**	
9(b)	–3 and –2	**1**	
10(a)	–2	**1**	
10(b)	–1	**1**	
10(c)	0	**1**	
11(a)	1.2×10^{-4}	**1**	
11(b)	5.29×10^{7}	**2**	**C1** for figs. 529; or for 5.3×10^{7} or **B1** for 55×10^{6} ; or for 0.21×10^{7}; or for figs 529
12	Correct method to eliminate one variable	**M1**	Either equating one set of coefficients, or equating expressions in either [m]x or in [m]y, or substituting for x or for y.
	Both x = –2 and y = 5 nfww.	**A2**	**A1** for either x = –2 or y = 5 nfww. After A0, **C1** for a pair of values that satisfies either original equation.
13(a)	Correct line	**1**	
13(b)	$\frac{7}{15}$ cao	**1**	
13(c)	240	**1**	
14(a)	0.106	**1**	
14(b)	5.678 to 5.68[0]	**1**	
14(c)	3180	**1**	
15(a)	$5 - 6t$	**1**	
15(b)	$\frac{4x^2}{3y}$ or $\frac{4x^2y^{-1}}{3}$	**2**	**C1** for two of $\frac{4}{3}$, x^2, denominator y (or y^{-1} in numerator) correct. or **B1** for $8x^6y^3$

Question	Answer	Marks	Partial Marks
16(a)	(5, 3)	**1**	
16(b)	164 nfww	**2**	**M1** for $[0 - 10]^2 + [7 - (-1)]^2$ or for $[10 - 0]^2 + [-1 - 7]^2$
17(a)	Correct curve from (4, 77) to (6, 90) via (5, 87)	**1**	
17(b)(i)	2.8	**1**	
17(b)(ii)	67 or 68	**1**	
18(a)	14	**1**	
18(b)	36	**1**	
18(c)	72 nfww; or FT 90 – their**(b)**/2 nfww	**2**	**B1** for angle $OB2 = 18°$, where B is the bottom point. or **M1** for correct angle clearly identified.
19(a)	$5a (5a - 1)$	**1**	
19(b)	$(3b - 4)(3b + 4)$	**1**	
19(c)	$(2x + 3)(2y + t)$	**2**	**B1** for one of the partial factorisations: $2y(2x + 3)$; $t(2x + 3)$; $2x(2y + t)$; $3(2y + t)$
20(a)	Acceptable quadrilateral with visible arcs	**1**	
20(b)(i)	Acceptable bisector of angle ABC	**1**	
20(b)(ii)	Acceptable perpendicular bisector of BC	**1**	
20(c)	Acceptable PQ – dep. on correct types of loci in **(b)**.	**1**	
21(a)	(18, 6)	**1**	
21(b)	Both $y > 6$ **and** $y < \frac{x}{3}$	**1**	
21(c)	$h = 22$ and $k = 7$	**2**	**C1** for one correct
22(a)	$\frac{v}{10}$ oe	**1**	
22(b)	20 nfww	**3**	**M1** for $\frac{1}{2} \times (40 + 80) \times v$ oe or **B1** for two of $15v$, $40v$, $5v$. **M1** for *their* $60v$ = *their*(1200)

Question	Answer	Marks	Partial Marks
23(a)		**1**	
23(b)(i)	4	**1**	
23(b)(ii)	$\frac{1}{-1}, \frac{1}{1}, \frac{1}{2}, \frac{4}{-1}, \frac{4}{1}, \frac{4}{2}$ oe and isw	**2**	**C1** for 4 or 5 correct members
24(a)	6**a** + 2**b** oe	**1**	
24(b)(i)	3	**1**	
24(b)(ii)(a)	3**b**; or FT k**b**	**1**	
24(b)(ii)(b)	–3**a**	**1**	
25(a)	11, 36	**1**	
25(b)(i)	$2N+1$	**1**	
25(b)(ii)	$(N+1)^2$ oe	**1**	
25(c)	169	**2**	**B1** for *their* ***(b)(i)*** = 25; or for $N = 12$
26(a)	$\begin{pmatrix} -6 & -6 \\ 3 & 3 \end{pmatrix}$ oe	**2**	**C1** for 2 or 3 correct elements; or for 3 or 4 correct elements of $\begin{pmatrix} 6 & 2 \\ -1 & 3 \end{pmatrix}$ or **B1** for the correct matrix in the Wkg. and simplified, incorrectly, to give the response in the Ans.Space.
26(b)	$\begin{pmatrix} -2 & -6 \\ 3 & 7 \end{pmatrix}$	**2**	**C1** for 2 or 3 correct elements
26(c)	$\frac{1}{2}$; or 0.5 ; only	**1**	