Cambridge O Level

Cambridge International Examinations
Cambridge Ordinary Level

MATHEMATICS (SYLLABUS D) **4024/12**

Paper 1 **May/June 2016**

MARK SCHEME

Maximum Mark: 80

Published

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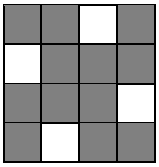
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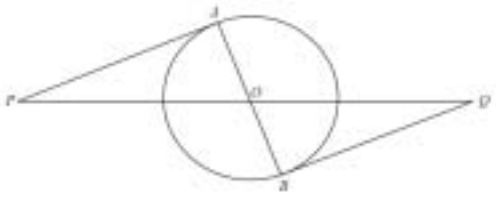
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Question	Answers	Mark	Part marks
1 (a)	0.69	1	
(b)	$\frac{8}{15}$ oe	1	
2 (a)	… 2 ... 2	1	
(b)		1	
3 (a)	Ruled straight line through (0, 0) and (100, 56)	1	
(b)	35 to 37	1	
4	… = 0.15 = 15[%] $\frac{5}{8}$ = 0.625 = …	2	**C1** for two or three correct
5 (a)	9	1	
(b)	–18	1	
6 (a)	$2^5 \times 3$	1*	
(b)	72	1	
7 (a)	1.5 [hours] or 90 [minutes] oe	1	
(b)	20 35	1	
8	7.2 or $\frac{36}{5}$ oe	2*	**M1** for $20 = 10^2k$ oe or $\frac{20}{10^2} = \frac{y}{6^2}$ oe
9	16	2*	**B1** for 15, 8 and 11 correctly placed and 26 not placed in Venn diagram or for $x + 26 + 8 = 50$ oe or for $50 – 26 – 8$ oe leading to answer
10	$x = 0.5$ oe $y = –2$	2*	**C1** for either x or y correct or for two values that fit one equation
11 (a)	$\frac{x^4}{3y^3}$	1	
(b)	$\frac{v^2}{2t}$	1	

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12 (a) (i)	arc radius 3.5 cm, centre *A*	1	
(ii)	bisector of angle *ACB*	1	
(b)	Correct region shaded	1	
13 (a)	27^0, $\sqrt[3]{1000}$, 5^2, 2^5	1	
(b) (i)	any value in range $4 < x < 9$	1	
(ii)	any value in range $-1 < x < 0$	1	
14 (a)	(–4, 2) (6, 2)	1	Both correct
(b)	(–3, –1) (5, 5)	2	**C1** for one correct or for two *x*-values or two *y*-values correct or for **both** (4, 6) **and** (–2, –2)
15 (a)	$x + y \leqslant 8$ oe $2y \geqslant x + 4$ oe $x \geqslant 0$	2	**C1** for two correct
(b)	3	1	
16 (a)	595	1	
(b)	340	2*	**M1** for 10×25.5 soi
17	280, 295, 310	3*	**C2** for two correct values OR **B2** for two from 70°, 40° and 55° seen OR **B1** for 70° seen or for 10° or 120° correctly positioned on diagram
18 (a)	16	1	
(b)	160 or 10 × *their* (a)	2ft*	**M1** for $0.5 \times$ *their v* $\times (8 + 12)$ oe or $0.5 \times$ *their v* $\times 4 +$ *their v* $\times 8$ oe

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Question	Answers	Mark	Part marks
19	$\angle POA = \angle QOB$ vertically opposite $AO = OB$ equal radii $\angle PAO = \angle QBO = 90°$ tangent perpendicular to radius 	3*	**B1** for two pairs of equal angles: $\angle POA = \angle QOB$ **and** $\angle PAO = \angle QBO$ or for one pair of angles and pair of sides: $\angle POA = \angle QOB$ **or** $\angle PAO = \angle QBO$ **and** $AO = OB$ AND **B1** for a correct reason linked with a correct pair of angles / sides
20 (a)	$\frac{2}{10}, \frac{2}{9}, \frac{8}{9}, \frac{1}{9}$ correctly positioned	1	
(b) (i)	$\frac{56}{90}$ oe	1*	
(ii)	$\frac{32}{90}$ oe	2ft*	**M1** for $\frac{8}{10}\times\frac{2}{9}+\frac{2}{10}\times\frac{8}{9}$ ft *their* tree diagram with fractions < 1
21 (a)	$2x + 3$ oe	1	
(b) (i)	7	1	
(ii)	$\frac{8-2x}{3}$ oe final answer	2*	**B1** for $3x = 8 - 2y$ or $3y = 8 - 2x$ or $2x = 8 - 3y$ or $2y = 8 - 3x$ or $1.5x = 4 - y$ or $1.5y = 4 - x$ or $\frac{8-2x}{3}$ oe seen or $\frac{8-2y}{3}$ oe seen
22 (a)	1.8×10^8 cao	2	**C1** for $1.7[\ldots] \times 10^8$ or answer figs 18
(b)	5	1	
(c)	20 cao	2*	**C1** for answer figs 2 or answer 18 OR **B1** for 4×10^7 oe **and** 2×10^6 oe seen
23 (a)	Two correct bars drawn	2	**C1** for rectangle base 0 to 10 height 2.8 or for rectangle base 30 to 60 height 0.6
(b)	12	1	
(c)	$\frac{30}{150}$ oe or $\frac{18+m}{138+m}$ oe evaluated	2ft*	**B1 FT** for fraction with numerator or denominator correct or for answer 20% or 0.2

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Question	Answers	Mark	Part marks
24 (a)	320	3*	**M2** for $\frac{a}{360}\times\pi\times(3r)^2 = 8\pi r^2$ oe OR **M1** for $\frac{a}{360}\times\pi\times(3r)^2$ oe seen or for $8\pi r^2$ seen
(b)	$6r + \frac{16\pi r}{3}$ final answer	2*	**C1** for $kr + \frac{16\pi r}{3}$, where $k \geqslant 0$ OR **M1 FT** for $\frac{their320}{360}\times 2\pi\times 3r$ oe or for $6r + \frac{their320}{360}\times n\pi r$ oe where n is a positive integer
25 (a) (i)	–6	1	
(ii)	15	2*	**C1** for $15^2 - 5\times 15$ or for 15, –10 OR **M1** for $(p + 10)(p – 15)$ [= 0]
(b)	4	2*	**B1** for $3\times 5^2 - 5k = 55$ oe
26 (a)	$\frac{3+4t}{t-1}$ oe	3*	**C2** for $\frac{7}{t-1}$ or $\frac{3-4t}{t-1}$ OR **M1** for $t(p – 4) = p + 3$ or $pt – 4t = p + 3$ AND **M1** for isolating p terms after fraction eliminated e.g. $pt – p = 3 + 4t$ or $p(t – 1) = 3 + 4t$
(b)	$\frac{2x-1}{x-5}$ final answer	3*	**B1** for $(2x + 1)(2x – 1)$ seen AND **B1** for $(2x + 1)(x – 5)$ seen

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