



Cambridge International Examinations
Cambridge Ordinary Level

MATHEMATICS (SYLLABUS D)

4024/12

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.

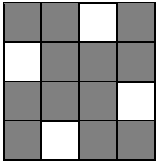
Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2016 series for most Cambridge IGCSE[®], Cambridge International A and AS Level components and some Cambridge O Level components.

© IGCSE is the registered trademark of Cambridge International Examinations.

This document consists of **5** printed pages.

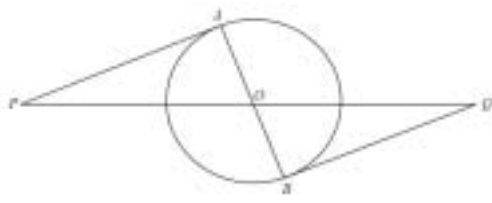
Page 2	Mark Scheme	Syllabus	Paper
	Cambridge O Level – May/June 2016	4024	12

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[%] $\frac{5}{8} = 0.625 = \dots$	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	

Page 3	Mark Scheme	Syllabus	Paper
	Cambridge O Level – May/June 2016	4024	12

Question	Answers	Mark	Part marks
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)	$x + y \leq 8$ oe $2y \geq x + 4$ oe $x \geq 0$	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 $10 \times \text{their (a)}$	2ft*	M1 for $0.5 \times \text{their } v \times (8 + 12)$ oe or $0.5 \times \text{their } v \times 4 + \text{their } v \times 8$ oe

Page 4	Mark Scheme	Syllabus	Paper
	Cambridge O Level – May/June 2016	4024	12

Question	Answers	Mark	Part marks
19	$\angle POA = \angle QOB$ vertically opposite $AO = OB$ equal radii $\angle PAO = \angle QBO = 90^\circ$ 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 <i>their</i> 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 $1.7[\dots] \times 10^8$ 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

Page 5	Mark Scheme	Syllabus	Paper
	Cambridge O Level – May/June 2016	4024	12

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 $k \geq 0$ 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