

CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the May/June 2014 series

4024 MATHEMATICS

4024/12

Paper 1, maximum raw mark 80

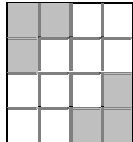
This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, 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.

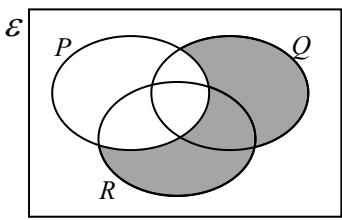
Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2014 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

Page 2	Mark Scheme	Syllabus	Paper
	GCE O LEVEL – May/June 2014	4024	12

Question	Answers	Mark	Part Marks
1 (a)	14	1	
(b)	0.3oe	1	
2 (a)	9	1	
(b)	−2.5	1	
3 (a)	Decimal between 0.75 and 0.875	1	
(b)	Fraction between $\frac{3}{4}$ and $\frac{7}{8}$	1	E.g. $\frac{13}{16}$ or $\frac{4}{5}$
4 (a)	47	1	
(b)	11 03	1	
5 (a)	8.52×10^{-5} final answer	1	
(b)	5×10^6	1	
6 (a)	Rotational symmetry of order 3 0 lines of symmetry	1	Both correct
(b)	Pattern completed correctly	1	
7	54	2	C1 for answer 36 Or B1 for $k = \frac{3}{200}$ oe or for $\frac{C}{24} = \frac{60^2}{40^2}$
8 (a)	Isosceles	1	
(b)	128°	1	
9 (a)	$\frac{25}{28}$ oe final answer	1	
(b)	$3\frac{1}{3}$ final answer	2	B1 for $\frac{10}{3}$ oe or for $\frac{16}{3} \times \frac{5}{8}$
10 (a)	406 000 000 oe	1	
(b)	5	2	B1 for two of 40, 10 and 0.8 seen

Page 3	Mark Scheme	Syllabus	Paper
	GCE O LEVEL – May/June 2014	4024	12

11 (a)		1	
(b)	12	2	B1 for 8 seen
12 (a)	$\begin{pmatrix} 172 \\ 206 \end{pmatrix}$ oe	2	B1 for one value correct
(b)	Amount taken on Monday and Tuesday	1	
13 (a)	17	1	
(b)	$\frac{2-x}{3}$ oe	2	C1 for $\frac{x-2}{3}$ oe B1 for $\frac{2-y}{3}$ Or M1 for $x = 2 - 3y$ soi
14 (a)	35.5	1	
(b)	118	2	B1 for use of 34.5 and 24.5
15 (a)	0.5	1	
(b)	$x \geq 1$ $y \geq 0.5x + 1$ oe	2	FT <i>their</i> gradient in $y \geq mx + 1$ B1 for one correct Or B1 for both $x = 1$ and $y = 0.5x + 1$ soi
16 (a)	40	1	
(b)	56.25	1	
(c) (i)	225	1	
(ii)	400	1	
17 (a)	$\begin{pmatrix} 3 \\ 1 \end{pmatrix}$	1	
(b)	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	1	
(c)	Correct enlargement, vertices $(-1, 2), (1, 2), (1, 6)$	2	B1 for two vertices correct for correct size and correct orientation

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18 (a)	135	1	
(b) (i)	165	1FT	FT 300 – <i>their</i> (a)
(ii)	24 cao	2	M1 for $360 \div (180 - \text{their } 165)$
19 (a) (i)	6	1	
(ii)	3	1	
(b)	$\frac{16b^6}{a^2}$ or $16b^6a^{-2}$	2	B1 for answer with 16 in numerator or for two out of three terms algebraically correct Or B1 for $\frac{(1)a}{4b^3}$ or better seen
20 (a)	$\frac{v}{25}$	1	
(b)	10	2	B1 for any correct expression for one area
(c)	108	1 FT	
21 (a)	$\frac{7}{10}, \frac{7}{9}, \frac{3}{9}, \frac{6}{9}$ correctly completed	1	
(b) (i)	$\frac{1}{15}$	1	
(ii)	$\frac{7}{15}$ FT	2	B1 for $\frac{21}{90}$ oe FT Or M1 for $\frac{3}{10} \times \frac{7}{9} + \frac{7}{10} \times \frac{3}{9}$
22 (a)	9	2	B1 for $\sqrt{15^2 - 12^2}$
(b)	279	2FT	B1 for $0.5 \times \text{their } 9 \times 12$ B1 for $(\text{their } 9)^2 + 12^2$
23 (a)	$2x^2 + 9x + 4$	1	
(b)	$\frac{7x+6}{x(x+2)}$ final answer	1	
(c)	2 or –5	3	B2 for $(x-2)(x+5)(=0)$ Or $\frac{-3 \pm \sqrt{49}}{2}$ B1 for $x^2 + 3x - 10 = 0$ oe 3 term equation or $x^2 + 3x - 10$

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24	(a)	Correct frequency polygons drawn	3	Consisting of these marks which can be awarded singly: B1 for linear scale up to 8 on frequency axis B1 for plots at correct heights B1 for plotting their points at centre of interval and joined with ruled lines
	(b)	$1 < t \leq 1.5$	1	
	(c)	Correct comment(s) making a comparison of times between girls and boys.	1	E.g. The mode for the boys is higher than the mode for the girls The range of times was longer for boys than for girls. Most girls spent between 1 and 2 hours, but boys times more evenly spread between 0 and 3 hours
25	(a)	$(2y + x) + (3y + x) + (2y + 10) + (3x + 5) = 360$	1	
	(b)	$x = 20, y = 35$	3	B2 for one correct with supporting working Or M1 for correct method to eliminate one variable, condoning one arithmetic slip , Or correct substitution to obtain an equation in one variable and A1ft for correct evaluation to find the other variable Or SC1 After 0 scored, for correct substitution and evaluation to find the other variable
	(c)	65 cao	1	