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.

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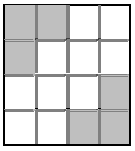
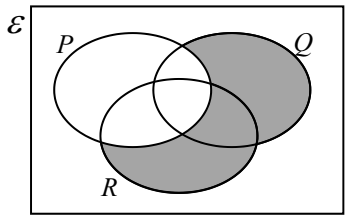
CAMBRIDGE
International Examinations

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

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)	$x \geqslant 1$ $y \geqslant 0.5x + 1$oe	2	FT *their* gradient in $y \geqslant mx + 1$ **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 corrector for correct size and correct orientation

18 **(a)**	135	1	
(b) **(i)**	165	1FT	FT 300 – *their* (a)
(ii)	24 cao	2	**M1** for 360 ÷ (180 – *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 × *their* 9 × 12 **B1** for (*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 $x^2 + 3x – 10$

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)	$1 < t \leqslant 1.5$	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	