

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the October/November 2014 series

4024 MATHEMATICS (SYLLABUS D)

4024/11

Paper 1, maximum raw mark 80

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Page 2	Mark Scheme	Syllabus	Paper
	Cambridge O Level – October/November 2014	4024	11

Abbreviations

cao	correct answer only
cso	correct solution only
dep	dependent
ft	follow through after error
isw	ignore subsequent working
oe	or equivalent
SC	Special Case
www	without wrong working
soi	seen or implied

Question	Answers	Mark	Part marks
1 (a)	41 006	1	
(b)	240 000	1	
2 (a)	12	1	
(b)	(0).08	1	
3 (a)	$\frac{3}{100}$ cao	1	
(b)	82	1	
4 (a)	64	1	
(b)	67	1	
5	$(2a - 3b)(c + 2d)$	2	B1 for one of the partial factorisations $c(2a - 3b)$; $2d(2a - 3b)$; $2a(c + 2d)$; $-3b(c + 2d)$ or their negatives, seen.
6 (a)	$\frac{8}{9}$	1	
(b)	28	1	
(c)	90	1	
7	A correct method to eliminate one variable Either $x = 4$ or $y = -1$ WWW. Both $x = 4$ and $y = -1$ WWW.	M1 A1 A1	If [0] earned, then award C1 for a pair of values that satisfy either equation.

Page 3	Mark Scheme	Syllabus	Paper
	Cambridge O Level – October/November 2014	4024	11

8	(a)	9	1	
	(b)	8	1	
	(c)	25	1	
9		8 WWW	3	M1 for a recognisable attempt at Pythagoras' Theorem with sides 10 and 6. M1 for $(AT^2 =) 10^2 - 6^2$ oe
10	(a)	$P \cap Q \cap R'$ oe	1	
	(b)	47	2	M1 for Cricket set inside the Football set, e.g. in a Venn diagram; Ans. = $30+8+9$; "30 play both cricket and football".
11	(a)	$\begin{pmatrix} 330 \\ 417 \end{pmatrix}$	2	B1 for 330 or 417 in a (2 by 1) matrix, or for (330 417).
	(b)	P shows the amount earned in Week 1 and Week 2, oe	1 dep	Must refer to (i) the amount earned (money, earnings, \$, etc) and (ii) the two weeks.
12	(a)	930	1	
	(b)	$\frac{2s - an}{n}$ oe	2	M1 for correct first step, e.g. $2s = an + bn$; $s = na/2 + nb/2$ or B1 for a correct expression for b seen in working, but followed by an error.
13		$d = \frac{5v^2}{64}$		M1 for $d = kv^2$, or for $5 = k \times 64$;
		125	3	B1 for $k = 5/64$, or for $\frac{d}{5} = \frac{40^2}{8^2}$
14	(a)	3.65	1	
	(b)	60 WWW	3	B1 for 192; or for cost price = \$120, so i by (profit =) \$72. M1 for $\left(\frac{\text{their}192 - \text{their}120}{\text{their}120}\right) \times 100$ oe
15	(a)	Triangle ABC drawn with an acceptable C .	2	B1 for $AC = 7$ cm or B1 for $\angle CAB = 130^\circ$
	(b)	21 to 22 inclusive, WWW; Or FT their triangle, provided the perp. height is not one of the sides, WWW.	2✓	M1 for $\frac{1}{2}$ base \times height with matching base and height.

Page 4	Mark Scheme	Syllabus	Paper
	Cambridge O Level – October/November 2014	4024	11

16	(a)	$x + y = 6$ drawn correctly	1	B1 for R correctly bordered by the lines $y = 2$ and $x = -1$; or FT appropriate shading between their sloping lines, provided one is correct	
	(b)	$2y + x = 4$ drawn correctly	1		
	(c)	Correct region shaded, (FT for sloping lines with one correct line).	2✓		
17	(a)	Valid method, with $\frac{1}{2}(11+7) \times 4 \times 5$ oe, leading to 180	1	AG	
	(b)	20 WWW	3	B1 for 22 500 or 0.18 and M1 for $\sqrt[3]{\frac{\text{figs } 225}{\text{figs } 18}}$ soi	
18	(a)	14 41	1		
	(b)	149	1		
	(c)	(i)	2 5 10 17		1
		(ii)	$n^2 - 1$ oe		1
19	(a)	1.36×10^9	1	B1 for figs 793, or for $N \times 10^5$ with $1 < N < 10$.	
	(b)	(i)	5.6×10^9		1
		(ii)	7.93×10^5		2
20	(a)	F	1		
	(b)	C	1		
	(c)	B	1		
	(d)	E	1		
21	(a)	(i)	... alternate (angles) ...	1	M1 for $\frac{180 - 58}{2}$, or B1 for a base angle = 61°
		(ii)	119°	2	
	(b)	120 WWW	2	C1 for 240. M1 for $2x + 80 + 95 + 125 = 540$, oe	

Page 5	Mark Scheme	Syllabus	Paper
	Cambridge O Level – October/November 2014	4024	11

22	(a)	42	1	
	(b)	Correct plots at 20, 40, 60, 90, 120 and CF curve drawn	2	B1 for three or four correct plots
	(c)	(i) 62 to 64 inclusive (ii) 41 to 46 inclusive WWW, FT ($F_{80}-F_{50}$) from their graph.	1✓ 2✓	FT from their CF graph M1 for attempt to calculate ($F_{80}-F_{50}$) from their graph.
23	(a)	(i) the point <i>B</i> marked correctly	1	If [0] scored in (a), in (aiii) award B1 for the vector $\begin{pmatrix} -6 \\ 1 \end{pmatrix}$ soi.
		(ii) the point <i>C</i> marked correctly	1	
		(iii) the point <i>D</i> marked correctly	1	
	(b)	(i) $\mathbf{q} - \mathbf{p}$	1	M1 for $\mathbf{OT} = \mathbf{OR} + \mathbf{RT}$ Or for $\mathbf{OT} = \mathbf{OP} + \mathbf{PR} + \mathbf{RT}$ Or for $\mathbf{OT} = \mathbf{OQ} + \mathbf{QR} + \mathbf{RT}$ Or equivalents in terms of \mathbf{p} and \mathbf{q} .
		(ii) $\frac{2}{3}\mathbf{p} + \frac{1}{3}\mathbf{q}$	1✓	
		(iii) $\frac{1}{3}\mathbf{q} - \left(\frac{4}{3}\right)\mathbf{p}$, or FT their(ii) $-2\mathbf{p}$	2✓	