

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

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MARK SCHEME for the October/November 2014 series

4024 MATHEMATICS (SYLLABUS D)

4024/11

Paper 1, maximum raw mark 80

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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.

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.

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		
	(b)	(i)	5.6×10^9	1	
		(ii)	7.93×10^5	2	B1 for figs 793, or for $N \times 10^5$ with $1 < N < 10$.
20	(a)	F	1		
	(b)	C	1		
	(c)	B	1		
	(d)	E	1		
21	(a)	(i)	... alternate (angles) ...	1	
		(ii)	119°	2	M1 for $\frac{180 - 58}{2}$, or B1 for a base angle = 61°
	(b)	120 WWW	2	C1 for 240. M1 for $2x + 80 + 95 + 125 = 540$, oe	

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✓	