

**MARK SCHEME for the May/June 2012 question paper
for the guidance of teachers**

4024 MATHEMATICS (SYLLABUS D)

4024/11

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.

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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

Qu	Answers	Mark	Part Marks
1	(a) The correct diagram	1	
	(b) A correct diagram	1	
2	(a) – 9	1	
	(b) 103	1	
3	(a) 18.75 (accept 15 to 20)	1	
	(b) arrow between $\frac{3}{4}$ and $\frac{7}{8}$	1	
4	(a) $3x^2(4 - 5x)$	1	
	(b) $(x - 3)(x + 2)$ oe Final ans.	1	
5	(a) 4.25	1	
	(b) 2.6	1ft	ft 6.85 – their(a)
6	0.0013	2	B1 for $\frac{22}{7} = 3.14285$ or better or 3.14286
7	(a) 48	1	
	(b) 72	1	
8	$m = 9$ $n = 11$	2	B1 for either $m = 9$ or $n = 11$
9	14 30	2	B1 for 90 seen or M1 for an attempt to find a common multiple
10	$x = 5$ $y = -3$	3	C2 for one correct with working and www M1 for a correct method to eliminate one variable

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11	(a)	$\frac{11}{35}$ oe isw	1	
	(b)	$\frac{20}{21}$ oe isw	2	B1 for $\frac{5}{3}$ and $\frac{7}{4}$ (or $\frac{4}{7}$) seen
12	(a)	2	1	
	(b)	8	1	
	(c)	$\sqrt{2}$	1	
13	(a)	64	1	
	(b) (i)	(0)9 50	1	
	(ii)	1.28 oe isw	1	
14	(a)	$\frac{6}{20}$ oe isw	1	
	(b)	$\frac{11}{20}$ oe isw	2	M1 for $(1 - \frac{3}{4}) \times (1 - \frac{3}{5}) + \frac{3}{4} \times \frac{3}{5}$
15	(a)	2^9	1	
	(b)	44	2	B1 for 3×2^4 or 2^2 soi or $2^{10}(2^2 \times 9 - 3)$
16	(a)	60	1	
	(b)	20.7	2	M1 for their $18 \times (1).15$ oe
17	(a)	4×10^{10}	1	
	(b)	5.6×10^8	2	C1 for 56×10^7 oe or M1 for figs 56 or their grams $\div 1000$
18	(a)	$\frac{3}{5}$ oe	1	
	(b)	$(y) \geq 2$	1	
	(c)	$\frac{7}{10}$ oe	2	M1 for $3(2t - 1) = 4(1 - t)$ soi or for both $6t - 3$ and $4 - 4t$ seen
19	(a)	Table completed correctly	1	
	(b)	n^2	1	
	(c)	$n^2 - n$ oe	1	
	(d)	780	1	

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20	(a)	1 3	1	
	(b)	1 4	1	
	(c)	2	1	
	(d)	(-1, 3) oe	1	
21	(a) (i)	15	1	
	(ii)	27	2	B1 for either 35×0.6 or 5×1.2 oe seen
	(b)	54	1ft	ft their(a) $\times 3.6$ if less than 360
22	(a)	$\frac{24}{11}$ oe isw	2	M1 for $\frac{1}{b} = \frac{11}{24}$
	(b)	$\frac{bc}{c-b}$ oe	3	M1 for $\frac{1}{b} = \frac{c+d}{cd}$ or $\frac{1}{d} = \frac{1}{b} - \frac{1}{c}$ or $cd = bd + bc$ M1 for $cd - bd = bc$ or $\frac{1}{d} = \frac{c-b}{bc}$ After one of the M1 's earned, allow A1 ft for a correct conclusion from the second M stage.
23	(a)	1.5 oe	1	
	(b)	$0.7 - 1$	2	Dependent on a tangent drawn. M1 for tangent drawn at $t = 8$
	(c)	570	2	B1 for $(48 - 15) \times 15$ or $\frac{1}{2} \times 15 \times (58 - 48)$ or $\frac{1}{2}(48 - 15) \times 15$ or $\frac{1}{2}(58 - 15) \times 15$
24	(a)	Similar triangles justified	2	B1 for $BAX = AYD$ or $DAY = AXB$ (Alternate) or for $ABX = ADY$ (opposite in parallelogram)
	(b)	10.5 oe	2	B1 for $\frac{12}{8}$ or $\frac{8}{12}$ soi
	(c)	3	2	M1 for $\frac{CX}{9} = \frac{4}{12}$ or $\frac{CX}{9-CX} = \frac{4}{8}$ oe or B1 for $BX = \frac{9 \times 8}{12}$
25	(a) (i)	25	1	
	(ii)	10	1	
	(iii)	$\frac{2}{3} - \frac{1}{2}$	2	M1 for $6x^2 - x + 3 = 5$ or better seen
	(b)	$6a^2 + 11a + 8$	2	M1 for $6(a+1)^2 - (a+1) + 3$ seen