

**MARK SCHEME for the October/November 2010 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.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

- CIE will not enter into discussions or correspondence in connection with these mark schemes.

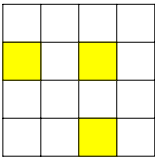
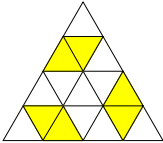
CIE is publishing the mark schemes for the October/November 2010 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.



Page 2	Mark Scheme: Teachers' version	Syllabus	Paper
	GCE O LEVEL – October/November 2010	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
 art anything rounding to
 soi seen or implied

1	(a)	$7.7, 7\frac{7}{10}$, only	1	
	(b)	0.039 oe	1	
2	(a)	$\frac{16}{21}$ oe	1	
	(b)	$\frac{3}{4}$ oe	1	
3	(a)	$\frac{3}{5}$ cao	1	
	(b)	725	1	
4	(a)	5	1	
	(b)	16	1	
5	(a)		1	
	(b)		1	
6	(a)	40.5	1	
	(b)	12.15 ft $0.3 \times$ their (a)	1ft	
7	9		2	or B1 for “ k ” = 36 (oe), or for $4 \times 3^2 = y \times 2^2$ (oe)
8	10 from using 0.4, 7^2 and 2		2	M1 for 0.4 and (49 or 50), or for $\sqrt[3]{8.11} = 2$
9	(a)	$(x) > 4\frac{1}{2}$	1	Must be “ $x >$ ”
	(b)	-3, -2	1	
10	(a)	2	1	
	(b)	$\frac{1}{2}$, or 0.5, only	1	

11	(a)	40	1	
	(b)	74	1	
	(c)	246 ft 360 – (their (a) + their (b))	1ft	
12	(a)	$13x$	1	
	(b)	$\frac{1}{12y}$	1	
	(c)	$12a^3b^4$	1	
13	(a)	$2a(8a - 3), 2a(-3 + 8a)$, only	1	Not $2a(8a + -3)$
	(b)	$(3x - 4)(y + 2)$	2	Or C1 for $(3x \pm 4)(y \pm 2)$ or B1 for any factorisation of any two terms; e.g. $3x(2 + y), x(6 + 3y), -2(2y + 4)$
14	(a)	1.8×10^7	1	
	(b)	5×10^{-4}	2	or C1 for figs 5
15	(a)	15.7	2	or B1 for $\frac{100}{360} \times 2 \times \pi \times 9$ oe with “ π ” as $\pi, 3.14, 3.142$ or $\frac{22}{7}$
	(b)	33.7 ft their (a) + 18	1ft	
16	(a)	$-\frac{1}{3}$	1	
	(b)	Correct region indicated by shading.	2	Or C1 for region below $y = x + 3$ and above $3y + x = 3$ indicated by shading or by R.
17	(a)	$\begin{pmatrix} 3 & -2 & 1 \\ 0 & 6 & -6 \end{pmatrix}$	2	or C1 for 4 or 5 correct elements
	(b)	$(8 \ 0 \ -2)$	1	
18	Both $x = -6$ and $y = 7$		3	or C2 for either or C1 for a pair of values that fits either equation, provided that this pair has been obtained by the method of substitution, equal coeffs., or matrices/determinants and not by trial and error.
19	(a)	$\frac{4}{25}$ or 0.16	1	
	(b)	0	1	
	(c)	$\frac{12}{25}$ or 0.48	2	or C1 for $\frac{6}{25}, \text{ or } \frac{8}{25}, \text{ or } \frac{10}{25}, \text{ or } \frac{16}{25}$ (or for 0.24, 0.32, 0.4, 0.64)
20	(a)	1 : 6	1	
	(b)	(i) $(3, 2)$	1	
	(b)	(ii) $k = -5$	2	or B1 for $4 \times 5 + 6k$

Page 4	Mark Scheme: Teachers' version	Syllabus	Page
	GCE O LEVEL – October/November 2010	4024	11

21	(a)	0.32	2	or B1 for $\cos ABD = -0.53$ soi or B1 for $\cos b = \frac{BC}{4}$ soi or M1 for a valid method.
	(b)	2.12	2	
22	(a)	36, 52, 62, 70	1	
	(b)	$3 < t < 4$	1	
	(c)	10 4	1 1	
23	(a)	$8^2 - 6^2 = 4 \times 7$	1	
	(b)	$(n + 1)^2 - (n - 1)^2 (= 4n)$	1	
	(c)	2080 cao	1	
	(d)	Both $x = 122$ and $y = 120$	1	
24	(a)	Reflection $y = -\frac{1}{2}$	1 1	
	(b) (i)	ΔC has vertices $(-1, 0)$, $(-2, 0)$ and $(-2, 2)$	1	
	(b) (ii)	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$	1	
25	(a)	$(-\frac{4}{5}, (-)0.8, \text{ only}$	1	
	(b)	[Rectangle = 4×20] + [triangle = $\frac{1}{2} \times 5 \times 4$]; or trapezium = $\frac{1}{2} \times 4(20 + 25)$ or $\frac{1}{2} \times 4 \times 45$	1	
	(c)	Straight line from $(0, 0)$ to $(20, 80)$. Curve, concave downwards, from $(20, 80)$ to $(25, 90)$.	1 1	
26	(a)	Both $\angle A = \angle C$ (given) and $\angle B$ is common or $\angle ABC = \angle DBC$ oe with no incorrect statements.	1	
	(b)	5 www	3	

Page 5	Mark Scheme: Teachers' version	Syllabus	Paper
	GCE O LEVEL – October/November 2010	4024	11

27	(a)	96° to 98° inclusive	1	
	(b)	(i) Arc of circle, centre C , radius 8 cm	1	
		(ii) Bisector of angle BAC	1	
	(c)	Correct region shaded	1	