

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE O Level

MARK SCHEME for the November 2005 question paper

4024 MATHEMATICS

4024/01

Paper 1 maximum raw mark 80

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which Examiners were initially instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began. Any substantial changes to the mark scheme that arose from these discussions will be recorded in the published *Report on the Examination*.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes must be read in conjunction with the question papers and the *Report on the Examination*.

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

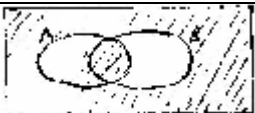
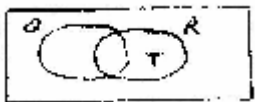
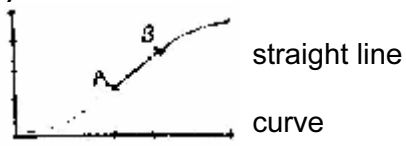
CIE is publishing the mark schemes for the November 2005 question papers for most IGCSE and GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.



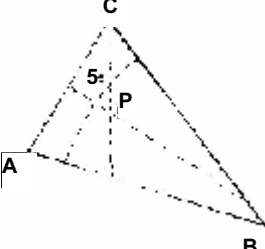
Page 1	Mark Scheme	Syllabus	Paper
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1	(a) 2.44 (b) (0).021	1 1	
2	(a) $\frac{9}{20}$ (b) $\frac{2}{15}$ c.a.o.	1 1	
3	(a) $\frac{3}{8}$ or $\frac{6}{16}$ only (b) 30	1 1	
4	(a) M, S, L (b) 20	1 1	
5	(a) $\frac{1}{4}$ c.a.o. (b) 2.4×10^6 c.a.o.	1 1	
6	(a) 190 (b) $\frac{1}{2}(n+1)(n+2)$ o.e. (seen)	1 1* [12]	Accept $(n+1+1)$
7	$\frac{90000}{50 \times 60}$ M1 30 A1	2*	
8	(a) 73 (b) 31 f.t. their 73 – 42 (c) 318	1 f.t. 1 1	
9	(a) Fig. 6 (b) Fig. 4 (c) Fig. 2	1 1 1	
10	(a) 75 (b) $\frac{360}{180-165}$ or $(2n-4)90 = 165n$ M1 24 A1	1 1 2* [11]	o.e.
11	(a) $5x(x-2)$ (b) 4 (c) 0 or -2	1 1 1	
12	(a) $\hat{A}\hat{C}B = \hat{C}\hat{D}A$ and $\hat{B}\hat{A}C = \hat{A}\hat{C}D$ $\Rightarrow \Delta$ s similar (b) $\frac{7}{AD} = \frac{4}{6}$ or $\frac{6}{9}$ M1 $10\frac{1}{2}$ A1	1 1 2*	Any irrelevant or wrong information = 0

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13	(a) 	1	
	(b) (i) Squares (ii) 	1 1	Any clear indication of a set in $R \cap Q'$
14	(a) $y \geq \frac{1}{2}x$ o.e. (b) $-4\frac{1}{2} \leq x < -2$ -4 and -3	M1 A1 2* [12]	Accept as separate statements
15	(a) $\begin{pmatrix} 0 & 1 \\ -1 & 2 \\ 0 & -3 \end{pmatrix}$ (b) $(1-1)$	2 2	SC1 for 4 or 5 elements correct SC1 for a (1×2) matrix
16	(a) -17 (b) 5 (c) $\frac{1}{3}(x+5)$ (d) 3 f.t.	1 1 1 f.t. 1	Allow y etc.
17	(a) Idea of 100 ± 2.5 or 75 ± 2.5 340 $\frac{22.5 \text{ or } 21.5}{2.5 \text{ or } 3.5}$ 9	M1 A1 M1 A1 2* 2*	i.e. any one of 97.5, 102.5, 72.5 or 77.5 seen
18	(a) $x = 0$ $y = -2$ (b) (i) 13200 (ii) 500	1 1 1 1 [16]	
19	(a) $219 \rightarrow 221$ incl. (b) 13 (c) All 8 points plotted correctly Smooth curve (d) A – any comparison using curves	1 1 P1 C1 2 1	
20	(a) $13 - 14$ (b) $\frac{2}{3}$ or $0.66 - 0.67$ (c) (i) 500 (ii) 700 f.t. their $500 + 200$ (d) 	1 1 1 f.t. 1 L1 C1 2 [11]	A B from (30,300) to (40, their 500 f.t.) from (40, their 500 f.t.) to (60, their 700)

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21	<p>(a) (4, 4)</p> <p>(b) $(2\frac{1}{2}, 2)$</p> <p>(c) $y = 4$</p> <p>(d) $y = \frac{1}{2}x - \frac{1}{2}$ B1 + B1</p> <p>(e) 20</p>	<p>1</p> <p>1</p> <p>1</p> <p>2*</p> <p>1</p>	Mark at earliest $ax + by + c = 0$ stage
22	<p>(a) (6, 2)</p> <p>(b) (i) $(-2, 0)$ (ii) 90° AC</p> <p>(c) $(0, -2), (-4, -2), (-6, -6)$</p> <p>(d) $\begin{pmatrix} -\frac{1}{2} & 0 \\ 0 & -\frac{1}{2} \end{pmatrix}$</p>	<p>1</p> <p>1</p> <p>1</p> <p>2</p> <p>1</p> <p>[12]</p>	SC1 for 2 points plotted correctly or 3 points stated
23	<p>(a) (i) 1:2 000 000 (ii) 235 – 237</p> <p>(b)  <p>Constructions</p> <p>I L bisect C1</p> <p>II I bisect M1</p> <p>III arc B1</p> <p>The possible positions clearly indicated P1</p> </p>	<p>1</p> <p>1</p> <p>4</p> <p>[6]</p>	I within 2° II within 2° 2 mm III within 2 mm