UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the November 2005 question paper

0580/0581 MATHEMATICS

0580/02, 0581/02   Paper 2, maximum raw mark 70

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.

The minimum marks in these components needed for various grades were previously published with these mark schemes, but are now instead included in the Report on the Examination for this session.

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.

TYPES OF MARK

Most of the marks (those without prefixes, and 'B' marks) are given for accurate results, drawings or statements.

- **M** marks are given for a correct method.

- **B** marks are given for a correct statement or step.

- **A** marks are given for an accurate answer following a correct method.

ABBREVIATIONS

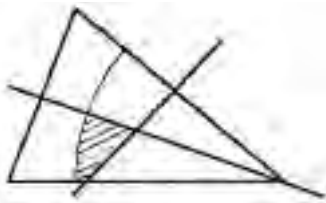|	
a.r.t.	Anything rounding to
b.o.d.	Benefit of the doubt has been given to the candidate
c.a.o.	Correct answer **only** (i.e. no 'follow through')
e.e.o.	Each error or omission
f.t	Follow through
i.s.w.	Ignore subsequent working
o.e.	Or equivalent
SC	Special case
s.o.i.	Seen or implied
ww	Without working
www	Without wrong working
√	Work followed through after an error: no further error made

* indicates that it is necessary to look in the working following a wrong answer

1		210	1	
2		$\frac{1}{2}$ or 0.5	1	
3		(0)	2	**M1** 12 + 12 – 24 Ignore brackets around 0
4	(a)	–1.8	1	
	(b)	21	1	
5		$10	2*	**M1** $\dfrac{800 \times 5 \times 3}{12 \times 100}$
6	(a)	0.8^2	1	Allow 0.64
	(b)	0.8^{-1}	1	Allow 1.25
7	(a)	3.16(227766)	1	
	(b)	0	1	
8		$\frac{1}{2}a - \frac{1}{2}c$	2*	M1 any answer or working simplifying to $\dfrac{1}{2}\mathbf{a} - \dfrac{1}{2}\mathbf{c}$
9	(a)	238<u>0</u>	1	
	(b)	2381.6<u>0</u>	1	
	(c)	2400	1	
10		5.7×10^{26}	3*	**M1** x 95 **A1** 5.7 **B1** 10^{26}
11		23	3*	**M1** $\dfrac{90}{360}$ x 4 x 2π x 1.2 **A1** 23.2 – 23.6 **B1** round down
12		$\sqrt[3]{2(c-5)}$ or $^3\sqrt{(2c-10)}$	3*	**B1, B1, B1** for each completed correct operation
13		7.5	3*	**M1** $F = \dfrac{k}{d^2}$ **A1** k = 480 **B2** 30 x 4^2 = F x 8^2
14	(a)	7a(c + 2)	1	
	(b)	$6ax(2x^2 + 3a^2)$	2	**B1** any 2 factors removed correctly

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15 (a)	54	1	
(b)	42	1	
(c)	78	1	
16	$x > -\dfrac{4}{7}$ or $x > -0.571$ (428571...)	3*	**M1** any 2 operations correct **M1** any 2 more operations correct
17 (a)	72	2*	**M1** $360 \div 5$ or $180 - 540/5$
(b)	36	1 ft	$\frac{1}{2}$ (a)
18 (a)	$x^{18}/9$	2	**B1 B1**
(b)	$2x$	2	**B1** kx or **B1** $2x^k$ where k is number
19 (a)	$-\frac{1}{2}$ or -0.5	2*	**M1** $5/10$ or $-ve$
(b)	$y = -\frac{1}{2}x + 5$ o.e.	2* ft	**M1** for $y =$ (a) $x + c$ or $y = mx + 5$
20 (a)	80.6	2*	**M1** for area $\frac{1}{2}$ x 3 x 12.4 + 5 x 12.4
(b)	7	2*	**M1** 19.4 or 100 – (a) **M1** for 12.4 + v
21 (a)	6.93	2*	**M1** $AE^2 = 8^2 - 4^2$ o.e.
(b)	60.6	3*	**M1** 2 x (a) x 8 **M1** subtract π x 4^2
22 (a)		2	**M1** all construction arcs **A1** line accurate ±1° or **B1** accurate but no construction seen
		2	**M1** all construction arcs **A1** line accurate ±1mm or **B1** accurate but no construction seen ignore additional lines
(b)	arc radius 7 cm	1	ignore arc continuing outside the triangle
(c)	shading	1	below (a)(i) **and** left of (a)(ii) **and** right of arc
23 (a)	3.6	2*	**M1** for $5x = 18$ or $x - 18/5 = 0$
(b)	–0.3, –11.7 www	4*	**M1** for $\sqrt{132}$ **M1** for $\dfrac{-12 \pm k}{2}$ **A1** –0.3 **A1** –11.7 www NOTE SC2 for correct answers and no working Completing the square scores **M1** $\sqrt{33}$ **M1** $-6 \pm d$
	TOTAL	70	