UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the November 2005 question paper

0580/0581 MATHEMATICS

0580/03, 0581/03   Paper 3 (Core), maximum raw mark 104

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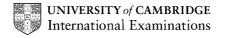
All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

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.

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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
$\sqrt{}$	Work followed through after an error: no further error made

Question	Answer	Marks	Comments	Total
1 (a)	Reflection drawn,	1	any recognisable reflected E in any vertical mirror line, allow	
	correctly in mirror line	1	good freehand	
(b)(i)	Rotation	M1	or turn or rotated	
	90° clockwise or –90	A1		
	centre of rotation marked or described unambiguously	A1		
(ii)	enlargement	M1	or enlarged	
	scale factor 3	A1		
	centre of enlargement marked or described unambiguously	A1	SC1 for "made 3 times larger" etc.	
(iii)	translation	1		
	$\begin{pmatrix} -7 \\ -5 \end{pmatrix}$	B1 B1	SC1 for both values correct but inverted, or correct values with other imperfection, for example given as coordinates.	[11]
2 (a)(i)	56.3	2	M1 for tan ABC = 6/4 oe	
(ii)	123.7	1√		
(b)	7.21	2	M1 for $6^2 + 4^2$ oe	
(c)	17.2 m 12 m^2	3√	M1 for area method A1 for both numerically correct B1 for both units correct	[8]
3 (a)(i)	5 –3 12	1 1 1		
(ii)	9 correct points plotted correct, smooth curve drawn	P3√ C1	P2 for 7 or 8 or P1 for 5 or 6	
(iii)	–0.8 to –0.7 2.6 to 2.8	1 1		
(b)(i)	8 and 2	1		
(ii)	points curve	P2 C1	P1 for 5 or 6 correct	
(iii)	3.1 to 3.3	1√	ft dep on only 1 point of intersection	[14]

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Question	Answer	Marks	Comments	Total
4 (a)	8.36	**3**	M1 for addition of at least 10 numbers M1 for divide by 14	
(b)	8 www	**2**	M1 for ranking list seen or SC1 for (6 + 10)/2 seen	
(c)	6	**1**		
(d)	3 4 4 3	**2**	1 for 2 or 3 correct	
(e)(i)	7/14 oe	**√1**	ft for their (4 +3)/their 14, correct or ft correct	
(ii)	3/14	**√1**		
(f)	12	**√2**	M1 for *their* (10 – 14) x 3	[12]
5 (a)	bearing 99 to 101° drawn angle BAC 109 to 111° drawn AB 4.9 to 5.1 cm AC 5.9 to 6.1 cm	**B1** **B1** **B1** **B1**		
(b)(i)	37 to 40	**1√**		
(ii)	247 to 250	**1√**	ft from **(b)(i)**	
(c)	8.9 to 9.1	**1√**		
(d)(i)	Two positions found, with appropriate arcs	**3**	2 for two positions without arcs and labelled 1 for one position found and labelled	
(ii)	P or Q	**1**		
	4.0 to 4.4	**√1**	ft for correct measurement of their closest position to B	[12]

Question	Answer	Marks	Comments	Total
6 (a)(i)	10.8 www	4	M1 for evidence of shape being broken down (or 6 by 2 rectangle – triangle) +M1 for one correct rectangular area. +M1 for evidence of triangle calculation	
(ii)	32400	2√	SC1 for figs 322 to 323 or M1 for (a)(i) x 3 x 1000	
(iii)	36	2	M1 for 6 x 3 x 2	
(b)(i)	61 hours and 30 min	2	M1 for 61.5	
(ii)	art 13500	1		
(iii)	3.38	2	M1 for their (b)(ii) x 2.5/10000	
(iv)	4	1 √	rounding <u>up</u>	[14]
7 (a)(i)	$y = 2x - 3$ oe	1		
(ii)	2 oe	2	SC1 for gradient of other line (–1)	
(iii)	3 2 1 0 –1	2	1 for two correct	
(iv)	correct line drawn	1		
(v)	(x =) 1.6 1.7, or 1.8 (y =) 0.2, 0.3, or 0.4	3	2 for correct answers not to 1 dp or 1 for 1 answer correct	
(b)	eliminating one of the variables eliminating the other variable (√) 1.66 or 5/3 only 0.3 or 1/3 only	M1 M1 A1 A1	working must be seen but second M1 can imply the first SC1 for 1.67 and 0.333	[13]
8 (a)	correct diagram			
(b)	13 16 19	2	1 for 2 correct	
(c)	298	2	M1 for evidence of a correct method	
(d)	$3n + 1$	2	1 for $3n + k$	
(e)	28	2	M1 for evidence of a correct method	[9]

Question	Answer	Marks	Comments	Total
9 (a)	51.4	3	2 for 51 or M1 for any complete method	
(b)(i)	Isosceles	1		
(ii)	$p = 50$	1		
	$q = 80$	1√	ft for $180 - 2p$	
	$r = 50$	1√	ft for $= p$	
	$s = 50$	1√	ft for $= p$	
	$t = 80$	1√`	ft for $= q$ or $180 - 2p$	
(c)	25	2	M1 for $90 - 65$ oe	
				[11]