UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the June 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.

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Grade thresholds for Syllabus 0580/0581 (Mathematics) in the June 2005 examinat

	maximum mark available	minimum mark required for grade:			
		A	C	E	F
Component 3	104	N/A	76	50	39

The threshold (minimum mark) for B is set halfway between those for Grades A and C.
The threshold (minimum mark) for D is set halfway between those for Grades C and E.
The threshold (minimum mark) for G is set as many marks below the F threshold as the E threshold is above it.
Grade A* does not exist at the level of an individual component.

June 2005

IGCSE

MARK SCHEME

MAXIMUM MARK: 104

SYLLABUS/COMPONENT: 0580/03, 0581/03

MATHEMATICS

Paper 3 (Core)

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

Question			Answer	Marks	Comments	
1	(a)		2.8	1	ignore minus sign, accept 2800 g	
	(b)		106.5(0)	1	107 is X (but remember to look back for 106.5)	
	(c)	(i)	10 40	1	accept 10.40, 10:40, 10.40 am	
		(ii)	1 (hour) 30 (mins)	1 f.t.	f.t. from **(c)(i)** [f.t. is **(c)(i)** > 12 10] accept 1 ½ (hours), 1.5 (hours), 90 (mins)	
	(d)		13.55	1	accept 1.55 (pm) but 01 55 and 1.55 am are X	
	(e)		357	3	M2 for 420 – 15 x 420/100, 420 x 85/100 o.e. or M1 for 15 x 420/100 o.e. answer of 63 is M1 implied	
						8
2	(a)		–2 1 2 –7	3	B2 for 3 correct, B1 for 1 or 2 correct	
	(b)		9 correct points plotted	P3 f.t.	P2 f.t. for 7 or 8 correct, P1 f.t. for 5 or 6 correct limit for acurracy is ½ small square	
			smooth curve drawn	C1	must go through the 9 correct points not dependent on P3	
	(c)		–0.4 (±/0.1)	1	please note no f.t. on this part	
			2.4 (± 0.1)	1		
	(d)	(i)	correct line drawn	1	accept dotted/dashed line must be full length from (1, –14) to (1,2)	
		(ii)	$x = 1$	1 f.t.	f.t. from **(d)(i)** if $x = k$ any reference to y is X	
						11
3	(a)	(i)	–3 9	1 1		
		(ii)	9	1	ignore minus sign	
	(b)		correct max drawn correct min drawn	1 f.t. 1 f.t.	} f.t. is from **(a)(i)** [Sunday] } allow Sunday (only) to be 1 square out horizontally } allow freehand straight lines	

	(c)	**(i)**	3	1 f.t.	f.t. is 3 if Sunday negative otherwise 2 allow 3 out of 7	
		(ii)	Sunday	1 f.t.	f.t. if not Sunday is Thursday	
	(d)		42.8	2	M1 for 9 x 6/5 + 32 or better e.g. 54/5 + 32, 10.8 + 32 answer of 43 is M1 implied	
						9
4	**(a)**	**(i)**	3 –1	1 1		
		(ii)	correct translation drawn	1 f.t.	} f.t. where possible (i.e. still on the grid)	
				1 f.t.	} condone inaccuracy/unruled if intention is clear } if ½ scale used then penalise first occurence only (–1)	
	(b)	**(i)**	–2 2	1 1		
		(ii)	correct translation drawn	1 f.t.	} f.t. where possible (i.e. still on the grid)	
				1 f.t.	} condone inaccuracy/unruled if intention is clear	
	(c)		enlargement (centre) (0,0) o.e. (scale factor) 2	1 1 1	} } must be a single transformation }	
	(d)	**(i)**	1	1		
		(ii)	1	1		
		(iii)	correct rotation drawn	2	SC1 for 180 rotation about any other point SC1 for ±90 rotation about O	
		(iv)	reflection in the *x*-axis oe	M1 B1(dep)	} must be a single transformation } condone inaccuracy/unruled if intention is clear } enlargement, s.f. = –1, centre (0,0) is B2	
						17
5	**(a)**	**(i)**	8 7 10 9 8 18	3	2 for 4 or 5 correct, 1 for 2 or 3 correct accept tallies if in 5's, accept 8/60, 7/60 etc.	
		(ii)	6	1 c.a.o		
		(iii)	4	2 c.a.o	M1 for evidence of ranking (cum. freq.)	

		(iv)	3.9	3 c.a.o	M1 (f.t.) for 8 x 1 + 7 x 2 + 10 x 3 or 8 +14 +30 (min 3) M1 (f.t.) dep. for /60 [both M marks may be by the table] answer of 3.93(3333) is M2 implied 39.3(33...) is M1 implied	
	(b)	**(i)**	60	2	M1 for 10 + 7 + 10 + 7 + 14 + 12 (min 3)	
		(ii)	3.7(3333)	3	M1 (f.t.) for 10 x 1 + 7 x 2 + 10 x 3..... or 10 +14 + 30..... (min 3) M1 (f.t.) dep. for /**(b)(i)**	
						14
6	**(a)**	**(i)**	6	2	M1 for 6x = 36 or 3x = 18 o.e.	
		(ii)	72	2 f.t.	f.t. is 2 x **(a)(i)** x **(a)(i)** M1 (f.t.) for 6 x 12, 2 x 36, 2 x 6 x 6	
	(b)	**(i)**	1.5 or 1 ½ or 3/2	2	M1 for 3y – y = 3 o.e. [unknown on one side]	
		(ii)	4z + 2 = 10z – 1	1	accept any equivalent equation in z if **(b)(ii)** is left blank may recover mark if 4z + 2 = 10z – 1 seen in **(b)(iii)**	
		(iii)	0.5 or ½ or 3/6	3	B1 for correct single z term B1 for correct single constant term	
	(c)	**(i)**	$a - b = 3$ o.e. $4a + b = 17$ o.e. $5a = 20$ $4a + b + 3 = a - b + 17$	} 1,1 }	if **(c)(i)** is left blank may recover mark(s) with $a - b = 3$, $4a + b = 17$, $5a = 20$ seen in **(c)(ii)**	
		(ii)	(a=) 4 and (b=) 1	3	2 for *either* (a=) 4 or (b=) 1 or M1 (f.t.) for *correctly* eliminating one of the variables	
						15
7	**(a)**		050 (± 2)	2	M1 for correct angle but not 3 figures i.e. 50 (±2)	
	(b)	**(i)**	correct line drawn (± 2)	1	length at least 3 cms long	
		(ii)	correct position marked	1 f.t.	f.t is from line drawn in **(b)(i)** (±2 mm) but *must* be on the line AC	
	(c)	**(i)**	7 (± 2 mm)	1		
		(ii)	200000	2 c.a.o.	1 for figs 2 or SC1 for figs 1.94 to 2.06	

	(d)	**(i)**	correct locus drawn	2 f.t.	f.t. is for their scale (normally 5 cm) at least over sea allow dotted/dashed locus SC1 for any other circle with centre A drawn SC1 for ¼ correct circle over sea	
		(ii)	correct line SR drawn 5 to 6 incl.	1 f.t. 1	f.t. is for their S allow dotted/dashed line no f.t. on this part	
	(e)	**(i)**	18.6 to 19.4 incl.	2	SC1 for 9.3 to 9.7 incl. seen	
		(ii)	27.9 to 29.1 incl.	3	M1 for conversion of minutes to hours (min of 0.66, 0.67 if dec.) M1 (indep) f.t. for their distance **(e)(i)**/their time taken	
		(iii)	15.4	2 f.t.	f.t. is **(e)(ii)**/1.85 M1 for **(e)(ii)**/1.85 seen	
						18
8	**(a)**		208	3	M2 for 2(24 + 32 + 48) or 48 + 64 + 96 or 160 + 24 + 24 o.e. or M1 for 24 or 32 or 48 or 160 seen	
	(b)		192	2	M1 for 6 x 8 x 4	
	(c)	**(i)**	straight line AC	1		
		(ii)	12.8	3	M2 for 10 + 8 or 100 + 64 or 164 or M1 for 10 + 8 or 100 + 64 or 164 or SC1 for complete correct use of Pythagoras	
		(iii)	51.3 or 51.4	3	M1 for 10/8 and tan seen o.e. and M1 for tan 10/8 seen o.e. [the o.e include sin or cos with their **(c)(ii)**] or SC1 for complete correct use of a trig. ratio	
						12
						104