



## MARK SCHEME for the October/November 2006 question paper

### **0580 and 0581 MATHEMATICS**

**0580/02 and 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 instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began.

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.

The grade thresholds for various grades are published in the report on the examination for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses.

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

CIE is publishing the mark schemes for the October/November 2006 question papers for most IGCSE, 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.

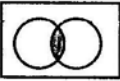


## ABBREVIATIONS

a.r.t.	Anything rounding to
b.o.d.	Benefit of the doubt has been given to the candidate
c.a.o.	Correct answer <b>only</b> (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



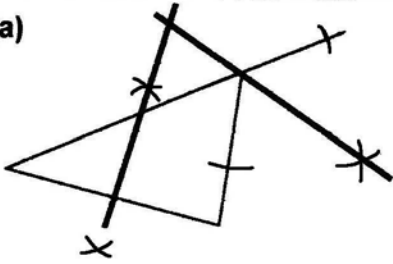
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\* indicates that it is necessary to look in the working following a wrong answer

1	-170	1	
2	(a) 3 (b) 8	1 1	
3	(a) ( $\pm$ ) 5 (b) 1	1 1	
4	237.5 242.5	1,1*	<b>M1</b> 7h 55 and 8h 05 seen, allow 0755 etc
5	310 to 360	2*	<b>B1</b> 290 to 309 or 361 to 390
6	$1/125000$ , $8 \times 10^{-5}$ , 0.0008, 0.8%	2*	<b>M1</b> changing any two correctly to a decimal or SIF
7	(a) 0 (b) 0.2 or $1/5$ (c) 0.6 or $3/5$	1 1 1 $\checkmark$	(b) x 3
8	(a) 2h 55m (b) 52.8	1 2*	<b>M1</b> $154 \div (a)$ in hours or <b>M1</b> $154 \times 60 / \text{their "175"}$
9	(a) 21 (b) $360x^2$ (c) 486	1 1 1	
10	(a)  (b) 336	2*  1	<b>M1</b> $(7x)^2 + (24x)^2 = 150^2$ , brackets essential but can be recovered. Candidate may show $x = 6$ works in Pythagoras
11	(a)  (b)  (c) 	1  1  1	Intersection shaded   Ensure that the intersection is NOT shaded

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12	(a) isosceles, tangents to circle equal (b) (i) $71^\circ$ (ii) $109^\circ$	1 1,1√	must mention tangent (ii) = $180 - (i)$
13	(a) 40 (b) 0.00004	2*,1√	<b>M1</b> vsf $50^3$ or $(4/2)^3$ (b) = (a) / 1000000
14	(a) 68 (b) 80 (c) -40	1,1,1	Not $\pm 40$
15	(a) 8 (b) $\frac{5-x}{3}$ (c) 8	1 2* 1	<b>B1</b> for for $\frac{x-5}{3}, \frac{5-x}{-3}$ or $\frac{5-y}{3}$
16	(a) $105x^2$ (b) 22.6	2* 2*	<b>M1</b> $\frac{1}{2} \times 5x \times (13x + 29x)$ oe <b>M1</b> $\tan y = \frac{5x}{12x}$ oe
17	(a) -10 (b) 4 and 1.5	2* 3*	<b>M1</b> $0.3x = -3$ oe <b>M1</b> $(x-4)(2x-3)$ <b>A1 A1</b> oe
18	(a)  (b) $67^\circ$	2* 2* 1	Perpendicular bisector of EG <b>M1</b> arcs <b>A1</b> $\pm 1^\circ, \pm 1\text{cm}$ (or <b>B1</b> if accurate and no arcs)  Angle bisector of GFH... ( $60^\circ$ ) <b>M1</b> arcs <b>A1</b> $\pm 1^\circ$ (or <b>B1</b> if accurate and no arcs) but must be an angle bisector $\pm 1^\circ$
19	(a) (23) (b) $x = 4$ $y = 6$ (c) determinant zero	2* 1,1 1	<b>M1</b> attempt at $5x^3 + 4x^2$ brackets optional oe
20	(a)(i) $4x(x+4)$ oe (ii) $x^2 + 2x + 12x + 16 + 4x^2 + 16x$ (b) 1.1 <b>cao</b> and <b>WWW</b>	1 1 4*	ignore any units or better <b>M1</b> $30^2 - 4 \times 5x - 40$ <b>M1</b> $\frac{-30 \pm \sqrt{k}}{10}$ <b>A1</b> 1.123 <b>A1</b> 1dp [or <b>M1</b> $6^2 - 4 \times 1x - 8$ <b>M1</b> $\frac{-6 \pm \sqrt{k}}{2}$ <b>A1 A1</b> ]
21	(a) $(2\frac{1}{2}, 4)$  (b) $y = \frac{5x-11}{3}$	3*  3*	<b>M1</b> consistent multiplication and + or - <b>A1A1</b> or <b>M1</b> rearrange and substitute <b>A1 A1</b>  <b>M1</b> $m = \frac{5}{3}$ <b>M1</b> finding c correctly
	TOTAL	70	