

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2008 question paper

0580/0581 MATHEMATICS

0580/21 and 0581/21 Paper 21 (Extended), maximum raw mark 70

This mark scheme is published as an aid to teachers and candidates, 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.

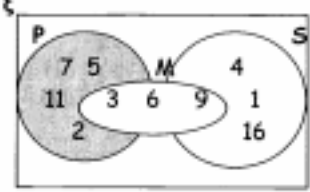
Mark schemes must be read in conjunction with the question papers and the report on the examination.

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

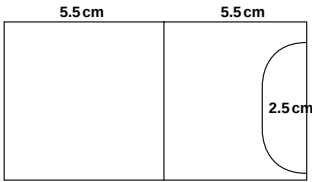
CIE is publishing the mark schemes for the May/June 2008 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.



Page 2	Mark Scheme	Syllabus	Paper
	IGCSE – May/June 2008	0580/0581	21

1	53 and 59	1, 1	independent of each other
2	$\frac{11x}{18}$	2	M1 $\frac{6x}{18} + \frac{10x}{18} - \frac{5x}{18}$ oe fractions with common denom. not decimals
3	150	2	M1 $\frac{18}{12} \times 100$
4	(a) 2870 (b) $(n+3)^2 + 1$	1 1	cao Allow $n^2 + 6n + 10$, $(n+2+1)^2 + 1$, $(n-1+4)^2 + 1$ oe
5	\$231.13 cao	2	M1 245 / 1.06 or $245 \times 0.94(3\dots)$ Allow 231, 231.1, 231.13... for M1
6	$\frac{598}{601} \quad \frac{399}{401} \quad \frac{698}{701}$	2	M1 correct decimals seen 0.99501.... 0.9957(2....) 0.99500... First and third must be to at least 5sf Accept these decimals in answer space
7	(a) 1045.28 cao (b) <u>1000</u>	1 1	 Allow 1.0×10^3
8	$9x^2$	2	B1 9 B1 x^2 terms must be multiplied
9	$y = \frac{1}{2}x + 5$	3	M1 ($m=$) $\frac{8-5}{6-0}$ oe B1 ($c=$) 5 or M1 A1 $y-8 = \frac{1}{2}(x-6)$ or $y-5 = \frac{1}{2}(x-0)$ Allow 3/6 for the $\frac{1}{2}$ A1 $y = \frac{1}{2}x + 5$ or $2y - x = 10$ oe
10	$r = 18$ $h = 42$ cao www	3	M1 Length scale factor of 6 used or stated A1 A1
11	$(\pm) 7.94$	3	M1 $21^2 = (2x)^2 + x^2 - 2.2x.x.\cos 120$ oe M1 $441 = 7x^2$
12	(a)  (b) 4	2 1✓	B1 P and S not intersecting. Two sets must be labelled Three intersecting circles will have $P \cap S$ empty. from the number of elements in the shaded area
13	$x < -23\frac{1}{2}$ or -23.5	3	M1 2 moves completed correctly M1 2 more moves completed correctly

Page 3	Mark Scheme	Syllabus	Paper
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14		1 1 1	Line in correct place; bisects rectangle Line 2cm long in correct place $\frac{1}{4}$ circles in correct place Not freehand.
15	$\begin{pmatrix} -11 \\ -11 \\ -14 \end{pmatrix}$	1 1 1	
16	(1, 3) www	3	M1 consistent multiplication and subtraction/addition A1 A1 Allow $x = 1$ and $y = 3$ (1, k) or (k, 3) scores 2 marks ONLY if M1 is scored
17	20	4	B1 $\frac{370 + x}{500 + x} = \frac{3}{4}$ oe fraction, decimal, percentage M1 two moves completed correctly M1 two more correct moves completed
18	(a) -14 (b) $2x^3 - 6x^2 + 12x - 9$ (c) $\frac{x+1}{2}$	1 2 2	 M1 attempting to double $f(x)$ and -1 M1 valid method
19	(a) (i) Triangle $(-1, -2)(-1, -3)(-3, -2)$ (ii) Reflection in $y = -x$ (b) $\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$	2 2 2	M1 for one correct vertex of the triangle drawn on the diagram M1 for the word reflection A1 $y = -x$ oe Combined transformation must be fully correct to the final answer but -1 once for the detail (e.g. centre, angle, etc) B1 each column or M1 solving two pairs of sim. equations A1 all correct in answer space
20	(a) 12900 (b) 23300 (c) (i) 2.33×10^{13} (ii) 1.55×10^{13}	3 1✓ 1✓ 2✓	M1 $(160^2 \text{ or } 100^2) \times \pi \times 95/360$ M1 subtracting the two areas above (a) multiplied by 1.8 (b) $\times 10^9$ M1 (c)(i) / 1.5

Page 4	Mark Scheme	Syllabus	Paper
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21	(a) 11.3	5	B1 identifying angle FAC M1 $600^2 + 800^2$ A1 1000 (for AC) M1 $\tan x = 200/\text{their } 1000$ (or $\cos x = "1000"/"1020"$) Alternative method via DF and AF M1 $"(200^2 + 600^2)" + 800^2$ A1 1020 M1 $\sin x / (\sin 90) = 200/"1020"$ oe cosine rule also possible
	(b) 233	3	M1 $\tan y = 800/600$ oe $\sin y, \cos y$ M1 an angle found in (b) + 180 written in working