

**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.

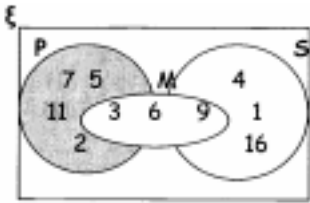
Mark schemes must be read in conjunction with the question papers and the report on the examination.

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

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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	<b>M1</b> $\frac{6x}{18} + \frac{10x}{18} - \frac{5x}{18}$ <b>oe</b> fractions with common denom. not decimals
3	150	2	<b>M1</b> $\frac{18}{12} \times 100$
4	(a) 2870 (b) $(n+3)^2 + 1$	1 1	<b>cao</b> Allow $n^2 + 6n + 10$ , $(n+2+1)^2 + 1$ , $(n-1+4)^2 + 1$ <b>oe</b>
5	\$231.13 <b>cao</b>	2	<b>M1</b> 245 / 1.06 or 245 $\times$ 0.94(3...) Allow 231, 231.1, 231.13... for <b>M1</b>
6	$\frac{598}{601}$ $\frac{399}{401}$ $\frac{698}{701}$	2	<b>M1</b> 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 <b>cao</b> (b) <u>1000</u>	1 1	<b>cao</b> Allow $1.0 \times 10^3$
8	$9x^2$	2	<b>B1</b> 9 <b>B1</b> $x^2$ terms must be multiplied
9	$y = \frac{1}{2}x + 5$	3	<b>M1</b> ( $m=$ ) $\frac{8-5}{6-0}$ <b>oe</b> <b>B1</b> ( $c=$ ) 5 <b>or</b> <b>M1</b> <b>A1</b> $y-8 = \frac{1}{2}(x-6)$ or $y-5 = \frac{1}{2}(x-0)$ Allow 3/6 for the $\frac{1}{2}$ <b>A1</b> $y = \frac{1}{2}x + 5$ or $2y - x = 10$ <b>oe</b>
10	$r = 18$ $h = 42$ <b>cao</b> <b>www</b>	3	<b>M1</b> Length scale factor of 6 <b>used or stated</b> <b>A1</b> <b>A1</b>
11	( $\pm$ ) 7.94	3	<b>M1</b> $21^2 = (2x)^2 + x^2 - 2.2x.x.\cos 120$ <b>oe</b> <b>M1</b> $441 = 7x^2$
12	(a)  (b) 4	2 1✓	<b>B1</b> 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	<b>M1</b> 2 moves <b>completed</b> correctly <b>M1</b> 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	<b>M1</b> consistent multiplication and subtraction/addition <b>A1 A1</b> Allow $x = 1$ and $y = 3$ (1, k) or (k, 3) scores 2 marks <b>ONLY</b> if <b>M1</b> is scored
17	20	4	<b>B1</b> $\frac{370 + x}{500 + x} = \frac{3}{4}$ <b>oe</b> fraction, decimal, percentage <b>M1</b> two moves <b>completed</b> correctly <b>M1</b> two more correct moves completed
18	(a) -14 (b) $2x^3 - 6x^2 + 12x - 9$ (c) $\frac{x+1}{2}$	1 2 2	<b>M1</b> attempting to double $f(x)$ and -1 <b>M1</b> 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	<b>M1</b> for one correct vertex of the triangle drawn on the diagram <b>M1</b> for the <b>word</b> reflection <b>A1</b> $y = -x$ <b>oe</b> Combined transformation must be fully correct to the final answer but -1 once for the detail (e.g. centre, angle, etc) <b>B1</b> each column <b>or</b> <b>M1</b> solving two pairs of sim. equations <b>A1</b> all correct in answer space
20	(a) 12900 (b) 23300 (c) (i) $2.33 \times 10^{13}$ (ii) $1.55 \times 10^{13}$	3 1√ 1√ 2√	<b>M1</b> $(160^2 \text{ or } 100^2) \times \pi \times 95/360$ <b>M1</b> subtracting the two areas above <b>(a)</b> multiplied by 1.8 <b>(b)</b> $\times 10^9$ <b>M1 (c)(i)</b> / 1.5

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