

**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**  
International General Certificate of Secondary Education

**MARK SCHEME for the May/June 2011 question paper**  
**for the guidance of teachers**

**0580 MATHEMATICS**

**0580/23**

Paper 2 (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, which would have considered the acceptability of alternative answers.

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

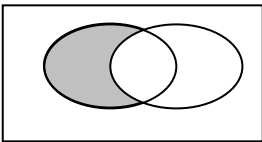
- Cambridge will not enter into discussions or correspondence in connection with these mark schemes.

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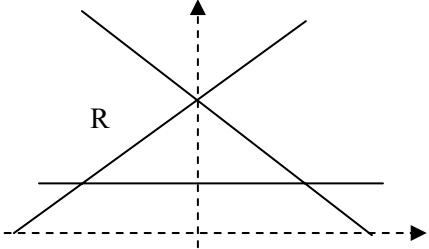
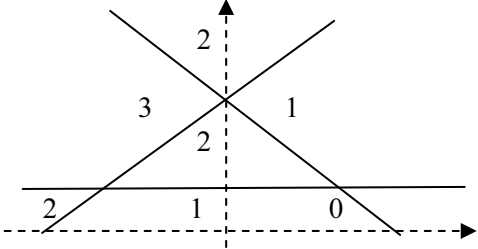
Page 2	Mark Scheme: Teachers' version	Syllabus	Paper
	IGCSE – May/June 2011	0580	23

### Abbreviations

cao	correct answer only
cso	correct solution only
dep	dependent
ft	follow through after error
isw	ignore subsequent working
oe	or equivalent
SC	Special Case
www	without wrong working

Qu.	Answers	Mark	Part Mark
1	$2y(x - 2z)$	2	<b>B1</b> for $y(2x - 4z)$ or $2(xy - 2yz)$
2	$(x =) 3(y - 5)$ oe final answer	2	<b>M1</b> for correct first move $y - 5 = \frac{x}{3}$ or $3y = x + 15$ <b>M1</b> for their correct second move
3 (a)		1	
(b)	14	1	
4	816 cao	2	<b>M1</b> 197.5 and 210.5 seen
5	$a$ any negative integer $n$ any even (positive) integer	2	<b>B1</b> for one correct
6 (a)	$1.646 \times 10^7$	1	
(b)	$3.32 \times 10^{-2}$	2	<b>B1</b> for 0.0332 seen or $3.3 \times 10^{-2}$ as answer or <b>B1</b> for $3.32 \times 10^k$
7 (a)	36	1	
(b)	correct working	2	<b>M1</b> for $\frac{7}{6}$ oe improper fraction <b>M1</b> for $\frac{12}{21} = \frac{4}{7}$ oe or visible cancelling
8	$(x =) 5$ $(y =) -1$	3	<b>M1</b> for consistent multiplication and add/subtract as appropriate <b>A1</b> for 1 correct answer
9	127.31 cao	3	<b>M1</b> for $120 \times 1.03^2$ <b>A1</b> for 127.308 If <b>M0</b> award <b>SC2</b> for 7.31 or 247.31
10	120	3	<b>M1</b> $7t + 11(t + 5) = 2215$ <b>A1</b> $18t + 55 = 2215$
11	500	3	<b>M1</b> $V = kL^3$ any letters may be used for $V$ , $k$ and $L$ <b>A1</b> $k = 4$

Page 3	Mark Scheme: Teachers' version	Syllabus	Paper
	IGCSE – May/June 2011	0580	23

12	$\frac{840-x}{d}$ or $\frac{840}{d} - \frac{x}{d}$	3	M1 $400 \times 2.1$ M1 “ $400 \times 2.1$ ” – $x$
13		3	Give the mark for R shown in region below 
14	$y = 4x + 1$	3	B1 correct numerical $y = mx + c$ B1 $c = 1$ B1 $m = 4$
15	4.94	3	M1 $\pi r^2 \times 12 = 920$ M1 $(r^2) = \frac{920}{\text{their } (\pi \times 12)}$
16	$\frac{5x-2}{(x-2)(x+2)}$	3	M1 $2(x+2) + 3(x-2)$ seen B1 $(x-2)(x+2)$ common denom. seen
17 (a)	4.5(0)	1	
(b)	200	2	M1 $0.5^3$ or $2^3$ seen
18 (a)	$27x^9$	2	B1 $kx^9$ or $27x^n$
(b)	$25x^4$	2	B1 $kx^4$ or $25x^n$
19 (a)	32	2	B1 figs 32 or 1 cm to 2.5 km or 8 000 000 seen
(b)	37.5	2	B1 (figs 25) <sup>2</sup> seen or figs 375 in answer
20 (a)	35	1	
(b)	55	1ft	90 – (a) but $b > 0$
(c)	55	1ft	= (b)
(d)	125	1ft	180 – (c)
21	96 www	5	M1 $3^2 + 4^2$ A1 5 M1 $\frac{1}{2} \times 6 \times \text{“5”}$ (= 15) M1 $4 \times \text{their triangle area} + 6^2$

<b>Page 4</b>	<b>Mark Scheme: Teachers' version</b>	<b>Syllabus</b>	<b>Paper</b>
	<b>IGCSE – May/June 2011</b>	<b>0580</b>	<b>23</b>

<b>22 (a)</b>	159	<b>3</b>	<b>M1</b> evidence of using area under graph <b>M1</b> stating area correctly
<b>(b) (i)</b>	50	<b>2</b>	<b>M1</b> $3 \times (1000/60)$ oe
<b>(ii)</b>	0.208	<b>2</b>	<b>M1</b> evidence of numerical rise/run or use of $(v - u)/t$