## **CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**International General Certificate of Secondary Education** 

## MARK SCHEME for the October/November 2012 series

## 0580 MATHEMATICS

0580/21 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 should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2012 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.



Page 2	Mark Scheme	Syllabus	Paper
	IGCSE – October/November 2012	0580	21

## **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 Marks
1	-16	2	<b>M1</b> for 4 × 6.5
2	[0].852 or $\frac{23}{27}$	2	<b>B1</b> for 85.56 or $\frac{2139}{25}$
3	(a) 3	1	
	<b>(b)</b> 4	1	
4	$\frac{\frac{17}{9}}{\frac{5}{2}} \text{ or } \frac{17}{9} \div \frac{5}{2}$	M1	$\frac{\frac{34}{18}}{\frac{45}{18}} \text{ or } \frac{34}{18} \div \frac{45}{18}$
	$\frac{17}{9} \times \frac{2}{5} = \frac{34}{45}$	M1	$\frac{34}{18} \times \frac{18}{45} = \frac{34}{45}$
5	$a^{(1)} - b^{(1)}$ www cao	2	<b>M1</b> for $a^{1/2}a^{1/2} - a^{1/2}b^{1/2} + a^{1/2}b^{1/2} - b^{1/2}b^{1/2}$ oe
6	144	2	M1 for ABC = 72 or AOC reflex = 216 Angles must be fully stated or marked in correct place on diagram
7	16	2	<b>M1</b> for 768 ÷ 48
8	543.19	3	M2 for $500 \times 1.028^3$ oe or long method or M1 for $500 \times 1.028^n$ , $n = 2$ or 4
9	$x \le 39$ www	3	M1 correct first move M1 correct 2nd move M1 correct move to answer line
10	70	3	<b>B1</b> 24.5 or 0.35 <b>seen M1</b> their LB ÷ their UB
11	2.5	3	M1 $R = k/d^2$ A1 $k = 40$ or M1 $Rd^2 = k$ A1 $k = 40$
12	112 or 112.3 to 112.33	3	M2 for $\pi \times 6^2 - \pi \times 0.5^2$ or M1 for $\pi \times 6^2$ or $\pi \times 0.5^2$ seen

Page 3	Mark Scheme	Syllabus	Paper
	IGCSE – October/November 2012	0580	21

13	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix} cao$	3	M2 for $\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$ $\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$ or B1 for one matrix seen	
14	114.6 or 114.57 (67027) to 114.59 (1155)	3	M2 2 × π × 4 × x/ 360 = 8 or M1 2 × π × 4 × x/ 360 or B1 8/2π4 or 2π4/ 8 seen	
15	180 www	3	M1 $\frac{1}{2} \times 60 \times 14$ oe M1 their $420 - 4 \times 60$	
16	$\frac{4y+2}{y-1} \text{ oe }$	4	M1 $xy - 4y = x + 2$ M1 collecting terms in x on one side M1 factorising M1 dividing by coeff of x	
17	(a) R	2	B1 for correct line, on each side of AB (longer than dash at C) B1 for 2 pairs of intersecting arcs	
		1	Intention to draw a full correct circle	
	(b)	1	R shaded must be a closed region	
18	(a) $\frac{7}{25}$ or $\frac{84}{300}$ oe	1		
	<b>(b) (i)</b> 62	1		
	(ii) 52	1		
	(iii) 19 to 20	1		
	(iv) 125	2	<b>B1</b> for 175 seen	
19	(a) $\begin{pmatrix} 17 & -32 \\ 16 & 1 \end{pmatrix}$	2	M1 any 2 entries correct	
	<b>(b)</b> $\begin{bmatrix} 10 & -8 \\ 4 & 6 \end{bmatrix}$	1		
	(c) 23 cao	1		
		2	$\mathbf{M1} \begin{pmatrix} 3 & 4 \\ -2 & 5 \end{pmatrix} \text{ or } \frac{1}{(\mathbf{c})} \begin{pmatrix} a & b \\ c & d \end{pmatrix} \text{ seen}$	

Page 4	Mark Scheme	Syllabus	Paper
	IGCSE – October/November 2012	0580	21

20	(a) 12	1	
	<b>(b)</b> $2x^3$ cao	2	M1 clear evidence of adding 1 then multiplying by 4 to $g(x)$
	(c) $\sqrt[3]{2(x+1)}$ oe	3	M1 each correct move
21	(a) triangle at $(1, 1), (1, -1), (2, -1)$	2	<b>SC1</b> triangle at (-1, -1),(-1, 1), (-2, 1)
	<b>(b)</b> triangle at $(-1, -1)(1, -1)$ , $(1, -2)$	2ft	correct or reflection of their triangle in
	(c) reflection in the x axis	2	y = -x <b>B1</b> reflection <b>B1</b> x axis or $y = 0$
		70	