International General Certificate of Secondary Education

## MARK SCHEME for the May/June 2013 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 May/June 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

Page 2	Mark Scheme	Syllabus	Paper
	IGCSE – May/June 2013	0580	21

## Abbreviations

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

(a+b)(p-2)

 $3x^4$ 

10

11

soi seen o	or implied		
Qu.	Answers	Mark	Part Marks
1	11 or –11	1	
2 (a)	1.32656	1	
<b>(b)</b>	1.327	1ft	
3	72	2	<b>M1</b> for 84 ÷ 7
4	105	2	<b>M1</b> for $180 - 55 - 50$ or <b>B1</b> for 55 or 75 seen in the correct angle inside the triangle
5	correct working; e.g. $\frac{3k}{2k} \times \frac{16n}{3n} = 8$	2	M1 for $\frac{3k}{2k}$ and A1 for $\frac{3k}{2k} \times \frac{16n}{3n} = 8$
6	3x(4y-x) final answer	2	<b>B1</b> for $3(4xy - x^2)$ or $x(12y - 3x)$
7 (a)	Equidistant from <i>A</i> and <i>B</i> (or <i>C</i> and <i>D</i> or <i>AD</i> and <i>BC</i> )	1	
(b)		1	
8	$x \ge -\frac{3}{8}$ oe	2	M1 for $-3 \le 8x$ oe If 0 then SC1 for $-\frac{3}{8}$ with incorrect inequality.
9	48.15, 48.45 cao	2	<b>B1 B1</b> If 0 then <b>M1</b> for 16.0 and 16.15 soi
		1	

2

2

**B1** p(a + b) - 2(a + b) or a(p - 2) + b(p - 2)

**B1** for  $kx^4$  or  $3x^k$ 

Page 3 Mark Scheme		Syllabus Paper	
	IGCSE – May/June 2013		
		T	
12 (a)	$\frac{3}{11}$	1	
(b)		1	
13	175 cao final answer	3	<b>B2</b> for 175.4 or <b>M1</b> for 200 ÷ 1.14
14	454.27 cao final answer	3	M1 for $420 \times (1 + \frac{4}{100})^2$ oe and A1 for 454 or 454.2 to 454.3 or SC2 for answer 34.27 or SC1 for answer 34.2 to 34.3
15	2.67 or 2.672 to 2.67301	3	<b>M2</b> for $\sqrt[3]{(80 \div \frac{4}{3}\pi)}$ oe or <b>M1</b> for $80 \div (\frac{4}{3}\pi)$ oe
16	35.4 or 35.36 to 35.37	3	M2 for $1000 \div (\pi \times 0.75^2 \times 16)$ oe or M1 for $\pi \times 0.75^2 \times 16$ oe or $1000 \div (\pi \times 0.75^2)$
17	y = 2x - 1	3	<b>B2</b> for $y = mx - 1$ or $y = 2x + c$ or $2x - 1$ or <b>B1</b> for gradient = 2, <b>B1</b> for $c = -1$ or <b>SC1</b> for $\frac{6}{3}$ or $\frac{51}{3[-0]}$
18 (a)	(x+6)(x-5)	2	SC1 for $(x + a)(x + b)$ where $ab = -30$ or $a + b$
(b)	$\frac{x+4}{x+6}$ final answer	1	
19	$\frac{6}{7}$ or 0.857[1]	3	<b>M1</b> for $t = \frac{k}{\sqrt{u}}$ oe <b>A1</b> for $k = 6$
20 (a) (i)	$\mathbf{p} + \frac{1}{2}\mathbf{r}$	1	
(ii)	2 <b>p</b> + <b>r</b>	1ft	$2 \times their$ (i)
<b>(b)</b>	Midpoint of <i>R</i> Q	1	

Page 4	Mark Scheme	Syllabus	Paper
	IGCSE – May/June 2013	0580	21

21	52.3 or 52.27 to 52.28	3	SC2 for 28.3 or 28.7 to 28.8 If 0, M2 for $\frac{135}{360} \times \pi \times 24 + 2 \times 12$ or M1 for $\frac{135}{360} \times \pi \times 24$
22	$\frac{5x+13}{(x+3)(x+2)}$ oe final answer	3	<b>B1</b> for common denominator $(x + 3)(x + 2)$ seen M1 for $2(x + 2) + 3(x + 3)$ soi
23	24.8 or 24.77 to 24.78	4	M1 for recognition of angle <i>CEA</i> M1 for $\sqrt{12^2 + 5^2}$ M1 for tan = $\frac{6}{\text{their } AE}$ oe
24 (a)	$ \begin{pmatrix} 6 & 7 \\ 16 & 17 \end{pmatrix} $ $ \frac{1}{5} \begin{pmatrix} 2 & -3 \\ -1 & 4 \end{pmatrix} $	2	<b>B1</b> for 1 correct row or 1 correct column
(b)	$\frac{1}{5} \left( \begin{array}{cc} 2 & -3 \\ -1 & 4 \end{array} \right)$	2	<b>B1</b> for $k \begin{pmatrix} 2 & -3 \\ -1 & 4 \end{pmatrix}$ or $\frac{1}{5} \begin{pmatrix} a & b \\ c & d \end{pmatrix}$
25 (a)	2.8 oe	1	
(b)	700	3	M2 for $\frac{1}{2}(20 + 30) \times 28$ oe or M1 for a correct area statement
26	420	5	M1 for $[CB =] \sqrt{4^2 + (9-6)^2}$ M1 for <i>their CB</i> from Pythagoras × 15 M1 for $[2 \times] \frac{1}{2}(6+9) \times 4$ M1 for 4 × 15, 9 × 15, 6 × 15 with intention to add