CAMBRIDGE INTERNATIONAL EXAMINATIONS

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.

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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.

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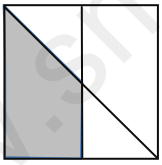
Abbreviations

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
soi	seen or implied

Qu.	Answers	Mark	Part Marks
1	11 or –11	**1**	
2 (a)	1.32656...	**1**	
(b)	1.327	**1ft**	
3	72	**2**	**M1** for 84 ÷ 7
4	105	**2**	**M1** for 180 – 55 – 50 or **B1** 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**	**B1** for $3(4xy - x^2)$ or $x(12y - 3x)$
7 (a)	Equidistant from A and B (or C and D or AD and BC)	**1**	
(b)		**1**	
8	$x \geq -\frac{3}{8}$ oe	**2**	**M1** for $-3 \leq 8x$ oe If 0 then **SC1** for $-\frac{3}{8}$ with incorrect inequality.
9	48.15, 48.45 cao	**2**	**B1 B1** If 0 then **M1** for 16.0 and 16.15 soi
10	$(a + b)(p - 2)$	**2**	**B1** $p(a + b) - 2(a + b)$ or $a(p - 2) + b(p - 2)$
11	$3x^4$	**2**	**B1** for kx^4 or $3x^k$

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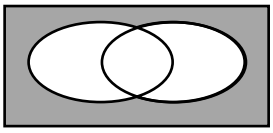
12 (a)	$\frac{3}{11}$	**1**	
(b)		**1**	
13	175 cao final answer	**3**	**B2** for 175.4 ... or **M1** for 200 ÷ 1.14
14	454.27 cao final answer	**3**	**M1** for $420 \times (1+\frac{4}{100})^2$ oe and **A1** for 454 or 454.2 to 454.3 or **SC2** for answer 34.27 or **SC1** for answer 34.2 to 34.3
15	2.67 or 2.672 to 2.67301	**3**	**M2** for $\sqrt[3]{(80 \div \frac{4}{3}\pi)}$ oe or **M1** for $80 \div \left(\frac{4}{3}\pi\right)$ 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**	**B2** for $y = mx - 1$ or $y = 2x + c$ or $2x - 1$ or **B1** for gradient = 2, **B1** for $c = -1$ or **SC1** for $\frac{6}{3}$ or $\frac{5 - -1}{3[-0]}$
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**	**M1** for $t = \frac{k}{\sqrt{u}}$ oe **A1** for $k = 6$
20 (a) (i)	$\mathbf{p} + \frac{1}{2}\mathbf{r}$	**1**	
(ii)	$2\mathbf{p} + \mathbf{r}$	**1ft**	2 × *their* (i)
(b)	Midpoint of *R*Q	**1**	

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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 f**or $\frac{135}{360}\times\pi\times 24$
22	$\frac{5x+13}{(x+3)(x+2)}$ oe final answer	**3**	**B1** 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 *CEA* **M1** for $\sqrt{12^2+5^2}$ **M1** for tan = $\frac{6}{\text{their } AE}$ oe
24 (a)	$\begin{pmatrix} 6 & 7 \\ 16 & 17 \end{pmatrix}$	**2**	**B1** for 1 correct row or 1 correct column
(b)	$\frac{1}{5}\begin{pmatrix} 2 & -3 \\ -1 & 4 \end{pmatrix}$	**2**	**B1** 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 ½(20 + 30) × 28 oe or **M1** for a correct area statement
26	420	**5**	**M1** for $[CB =]\sqrt{4^2+(9-6)^2}$ **M1** for *their CB* from Pythagoras × 15 **M1** for [2 ×] $\frac{1}{2}(6+9)\times 4$ **M1** for 4 × 15, 9 × 15, 6 × 15 with intention to add

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