CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2013 series

0581 MATHEMATICS

0581/23 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 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.

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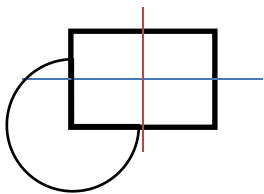
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Abbreviations

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

Qu.	Answers	Mark	Part Marks
1	39	2	**M1** for $52 \times 45 \div 60$ oe
2	Any two of (20, 8) (–4, 0) (12, 24)	2	**B1** for one correct
3	–8	2	**M1** for $2x = -16$ or $\frac{1}{2} + x = -7.5$ oe or better
4	tan 100, cos 100, 1/100, $100^{-0.1}$	2	**B1** for decimals –0.1[[7..]], –5.[67..], [0.01], 0.6[3..] or for three in the correct order
5	**(a)** 600 000	1	
	(b) 79.2	2	**M1** for $22 \times 60 \times 60 \div 1000$ oe
6	25[.00]	3	**M2** for $30 \times \frac{100}{120}$ oe or **M1** for 30 associated with 120% e.g. $1.2x = 30$
7	5	3	**M2** for $(x - 5)(x - 1)$ or **M1** for evidence of a factorisation which gives the correct coefficient of x or positive prime constant term e.g. $(x - 7)(x + 1)$, $(x - 4)(x - 2)$, $(x - 3)(x - 1)$
8	1.6 oe	3	**M1** for $m = kx^3$ **A1** for $k = 25$
9	**(a)** $a^2 + 2ab + b^2$	2	**B1** for a^2 [+] ab [+] ab [+] b^2 or better seen
	(b) 22	1	
10	160	3	**M1** for $\sin 15 = \frac{[]}{628}$ oe or better

11	(a) $\begin{pmatrix} 3 & -1 \\ 4 & 2 \end{pmatrix}$	1	
	(b) $\dfrac{1}{10}\begin{pmatrix} 2 & 1 \\ -4 & 2 \end{pmatrix}$ oe	2	**B1** for $\dfrac{1}{10}\begin{pmatrix} a & b \\ c & d \end{pmatrix}$ or **B1** for $k\begin{pmatrix} 2 & 1 \\ -4 & 3 \end{pmatrix}$
12	(a) 7.5×10^{-2}	2	**M1** for 0.075 or $\dfrac{3}{40}$ or $\dfrac{6}{80}$ or 0.75×10^{-1} oe
	(b) 9.3×10^{7}	2	**M1** for 93 000 000 or 93×10^{6} or 0.93×10^{8} oe
13	(a) 24	2	**M1** for $MOC = 48$
	(b) 24	2	**M1** for $ACM = 66$ or **B1** for 48 – *their* **(a)**
14	(a) $8q^{-1}$ or $\dfrac{8}{q}$	2	**B1** for $8q^{k}$ or kq^{-1}
	(b) 1/5 or 0.2	2	**M1** for $5^{-2}, \dfrac{1}{5^{2}}$ or [0].04 seen oe
15	(a) Circle, radius 3 cm, centre A, not inside the rectangle	2	**M1** for arc or full circle centre A radius 3 cm or for an incorrect size circle at A outside rectangle
	(b) One line of symmetry with correct arcs. E.g.:	2	**B1** for correct ruled line (must reach or cross two sides) **B1** for 2 pairs of intersecting arcs
16	(a) 8.61 or 8.609 to 8.6102	4	**M1** for $\dfrac{1}{2} \times 3^{2} \times \pi \times \sin 120$ **M1** for $\dfrac{30}{360} \times \pi \times 3^{2}[\times 2]$ **M1** for area of triangle + 2 sectors
	(b) 430 or 431 or 430.4 to 430.41	1FT	FT their **(a)** $\times$ 50

17	(a)	triangle at (0, 3) (2, 3) and (2, 4)	3	**B1** for each correct vertex If 0 scored then **M1** for correct reflection in the *y* axis or correct translation of their first stage 3 right 2 up
	(b)	reflection in *y* axis	2	**B1** for reflection **B1** for *y* axis or *x* = 0
18	(a)	19–19.1	1	
	(b)	3	2	**M1** for 47 seen
	(c)	4.9 to 5.7	2	**B1** for [UQ] 21.7 to 22.2 and [LQ] 16.5 to 16.8
	(d)	$\dfrac{45}{50}$ oe	2	**B1** for 45 seen or **SC1** for $\dfrac{5}{50}$ isw
19	(a)	75	2	**B1** for [g(6) =] 36
	(b)	3.5 –6.5	3	**M1** for $(2x + 3)^2 = 100$ **M1** for $2x + 3 = [\pm]10$ If 0 scored, **SC1** for one correct value as answer
	(c)	$\dfrac{x-3}{2}$ oe final answer	2	**M1** for $x = 2y + 3$ or $y - 3 = 2x$ or $\dfrac{y}{2} = x + \dfrac{3}{2}$ or better
	(d)	5	1	