CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2013 series

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 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 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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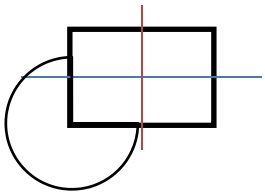
Abbreviations

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

Qu.	Answers	Mark	Part Marks
1	39	**2**	**M1** for 52 × 45 ÷ 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 **(b)** 79.2	**1** **2**	 **M1** for 22 × 60 × 60 ÷ 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)** $a^2 + 2ab + b^2$ **(b)** 22	**2** **1**	**B1** for a^2 [+] ab [+] ab [+] b^2 or better seen
10	160	**3**	**M1** for $\sin 15 = \frac{[]}{628}$ oe or better

11	**(a)** $\begin{pmatrix} 3 & -1 \\ 4 & 2 \end{pmatrix}$	**1**	
	(b) $\frac{1}{10}\begin{pmatrix} 2 & 1 \\ -4 & 2 \end{pmatrix}$ oe	**2**	**B1** for $\frac{1}{10}\begin{pmatrix} a & b \\ c & d \end{pmatrix}$ or **B1** for $k\begin{pmatrix} 2 & 1 \\ -4 & 3 \end{pmatrix}$
12	**(a)** 7.5×10^{-2}	**2**	**M1** for 0.075 or $\frac{3}{40}$ or $\frac{6}{80}$ 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 $\frac{8}{q}$	**2**	**B1** for $8q^{k}$ or kq^{-1}
	(b) 1/5 or 0.2	**2**	**M1** for $5^{-2}, \frac{1}{5^2}$ 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 $\frac{1}{2} \times 3^2 \times \pi \times \sin 120$ **M1** for $\frac{30}{360} \times \pi \times 3^2 [\times 2]$ **M1** for area of triangle + 2 sectors
	(b) 430 or 431 or 430.4 to 430.41	**1FT**	FT their **(a)** × 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) $\frac{45}{50}$ oe	**2**	**B1** for 45 seen or **SC1** for $\frac{5}{50}$ 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) $\frac{x-3}{2}$ oe final answer	**2**	**M1** for $x = 2y + 3$ or $y - 3 = 2x$ or $\frac{y}{2} = x + \frac{3}{2}$ or better
	(d) 5	**1**	