CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2014 series

0580 MATHEMATICS

| 0580/21 | Paper 2 (Extended), maximum raw mark 70 |

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Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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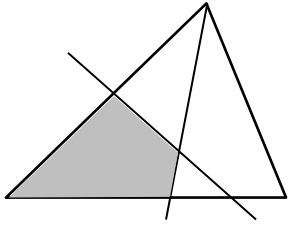
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Abbreviations

cao	correct answer only
dep	dependent
FT	follow through after error
isw	ignore subsequent working
oe	or equivalent
SC	Special Case
nfww	not from wrong working
soi	seen or implied

Qu.		Answers	Mark	Part Marks
1		8.1722 cao	2	**B1** for 8.17 or 8.172 or 8.1721 or 8.17215…
2		3 3.14 π 3.142 $\dfrac{22}{7}$	2	**B1** for 3.141[5...] to 3.1416 **and** 3.1428 to 3.1429 or 3.143 seen or **SC1** for 4 in correct order
3	(a)	E B A cao	1	
	(b)	Z cao	1	
4	(a)	–3	1	
	(b)	4	1FT	FT their numerical mode
5		$\dfrac{3}{12}$ and $\dfrac{2}{12}$ $\dfrac{5}{12}$ cao	M1 A1	Equivalent denominators can be used, working **must** be shown.
6	(a)	15.1 cao	1	
	(b)	20 cao	1	
7		2.5[0] or 2.501… nfww	3	**M2** for $2.1\times\left(1+\frac{6}{100}\right)^3$ oe or **M1** for $2.1\times\left(1+\frac{6}{100}\right)^n$ oe where $n\geq 2$ or for figs $21\times\left(1+\frac{6}{100}\right)^3$ oe
8		0.29 cao	3	**M2** for $30-\left(24\times1.2378\right)$ or $\left(24\times1.2378\right)-30$ or **M1** for 24×1.2378
9	(a)	280	1	
	(b)	5×10^6	2	**B1** for $5\,000\,000$ oe or **B1** for answer $k\times10^6$ or 5×10^k

10	3.75 oe	3	**M2** for $3 \times 5 = 7x - 3x$ oe or **M1** for $3(x + 5) = 7x$ or $x + 5 = \frac{7}{3}x$ or $1 + \frac{5}{x} = \frac{7}{3}$ or better
11 **(a)**	x^6	1	
(b)	$\dfrac{x^2}{3}$	2	**B1** for answer kx^2 or $\frac{x^k}{3}$ or $\frac{1}{3}$
12	$\begin{array}{c} 5 \\ -5 \end{array}$ nfww	3	**M1** for correctly eliminating one variable **A1** for $x = 5$ **A1** for $y = -5$ If zero scored **SC1** for correct substitution and evaluation to find the other variable
13	$[\pm]$ 8 nfww	3	**M1** for $y = k\sqrt{x + 5}$ **A1** for $k = [\pm]$ 2 or **M2** for $\dfrac{4}{\sqrt{-1 + 5}} = \dfrac{y}{\sqrt{11 + 5}}$ oe
14	$\begin{pmatrix} 4 & 16 \\ 2 & 8 \end{pmatrix}$	3	**M2** for $\begin{pmatrix} 12 & 48 \\ 6 & 24 \end{pmatrix}$ **and** $\begin{pmatrix} 8 & 32 \\ 4 & 16 \end{pmatrix}$ or **M1** for $\begin{pmatrix} 12 & 48 \\ 6 & 24 \end{pmatrix}$ **or** for $\begin{pmatrix} 8 & 32 \\ 4 & 16 \end{pmatrix}$
15 **(a) (i)**		2	**B2** for correct ruled bisector with correct arcs or **B1** for correct bisector with no/incorrect arcs
(ii)		2	**B2** for correct ruled bisector with correct arcs or **B1** for correct bisector with no/incorrect arcs
(b)		1	correct shading
16	142 or 142.0…	5	**B1** for $CBD = 30$ **M2** for $[\sin D =] \dfrac{6 \times \sin theirB}{8}$ oe or **M1** for $\dfrac{6}{\sin D} = \dfrac{8}{\sin(their30)}$ oe **A1** for $[D =]$ 22 or 22.0 or 22.02… **B1FT** for $90 + (their30 + their22)$ evaluated correctly for their final answer or for $360 - 90 - theirBCD$ evaluated correctly for their final answer

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17		890 or 890.1 to 890.2…	5	**M4** for $\frac{1}{2} \times \left(\frac{4}{3} \times \pi \times 5^3 \right) + \pi \times 5^2 \times 8$ or **M3** for $\frac{1}{2} \times \left(\frac{4}{3} \times \pi \times 5^3 \right)$ and $\pi \times 5^2 \times 8$ or **M2** for $\frac{1}{2} \times \left(\frac{4}{3} \times \pi \times 5^3 \right)$ or $\pi \times 5^2 \times 8$ or **M1** for $\frac{4}{3} \times \pi \times 5^3$
18	**(a)**	0.6 0.2 0.8 in correct places	2	**B1** for 0.6 in correct place **B1** for 0.2 and 0.8 in correct places
	(b)	0.52 oe nfww	3	**M2FT** for $1 - (their\ 0.6 \times their\ 0.8)$ oe or **M1FT** for a correct product from *their* tree in **(a)**
19	**(a)**	*CBA* and *BDA* are equilateral oe	1	
	(b)	67[.0] or 67.02 to 67.03	2	**M1** for $\frac{120}{360} \times \pi \times 8^2$ oe
	(c) (i)	39.3 or 39.28 to 39.33	3	**M2FT** for $their(\mathbf{b}) - \frac{1}{2} \times 8^2 \times \sin 120$ oe or **M1** for $\frac{1}{2} \times 8^2 \times \sin 120$ oe
	(ii)	78.6 or 78.7 or 78.56 to 78.66	1FT	**FT** $2 \times their$**(c)(i)** correctly evaluated
20	**(a)**	0.4 or $\frac{2}{5}$	2	**B1** for [f(2) =] 4 or **M1** for $\frac{2}{(3x-2)+1}$ or better
	(b)	–0.8 or $-\frac{4}{5}$	2	**M1** for $2 = 10(x+1)$ or better
	(c)	$3x - 6$ or $3(x-2)$ nfww	3	**M2** for $3(2x) - 2 - (3(x+2) - 2)$ or **M1** for $[f(2x) =] 3(2x) - 2$ or $[f(x+2)] = 3(x+2) - 2$