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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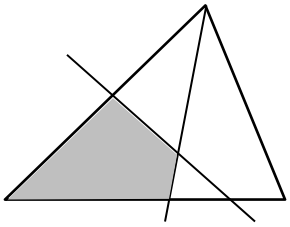
Abbreviations

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 $\frac{22}{7}$	**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	$\frac{3}{12}$ and $\frac{2}{12}$ $\frac{5}{12}$ 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 $30-\left(24\times 1.2378\right)$ or $\left(24\times 1.2378\right)-30$ 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 $k\times 10^6$ 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)	$\frac{x^2}{3}$	**2**	**B1** for answer kx^2 or $\frac{x^k}{3}$ or $\frac{1}{3}$
12	$\begin{matrix}5\\-5\end{matrix}$ 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	[±] 8 nfww	**3**	**M1** for $y = k\sqrt{x+5}$ **A1** for k = [±] 2 or **M2** for $\frac{4}{\sqrt{-1+5}} = \frac{y}{\sqrt{11+5}}$ 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 $[\sin D =] \frac{6 \times \sin theirB}{8}$ oe or **M1** for $\frac{6}{\sin D} = \frac{8}{\sin(their30)}$ oe **A1** for [D =] 22 or 22.0 or 22.02… **B1FT** for 90 + (*their*30 + *their*22) evaluated correctly for their final answer or for 360 – 90 – *theirBCD* evaluated correctly for their final answer

17		890 or 890.1 to 890.2…	**5**	**M4** for $\frac{1}{2}\times\left(\frac{4}{3}\times\pi\times5^3\right)+\pi\times5^2\times8$ or **M3** for $\frac{1}{2}\times\left(\frac{4}{3}\times\pi\times5^3\right)$ and $\pi\times5^2\times8$ or **M2** for $\frac{1}{2}\times\left(\frac{4}{3}\times\pi\times5^3\right)$ or $\pi\times5^2\times8$ or **M1** for $\frac{4}{3}\times\pi\times5^3$
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 × *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 $\frac{120}{360}\times\pi\times8^2$ oe
	(c) (i)	39.3 or 39.28 to 39.33	**3**	**M2FT** for $\textit{their}(\mathbf{b})-\frac{1}{2}\times8^2\times\sin120$ oe or **M1** for $\frac{1}{2}\times8^2\times\sin120$ oe
	(ii)	78.6 or 78.7 or 78.56 to 78.66	**1FT**	**FT** 2 × *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 $[f(x+2)]=3(x+2)-2$