CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2014 series

0581 MATHEMATICS

0581/21   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.
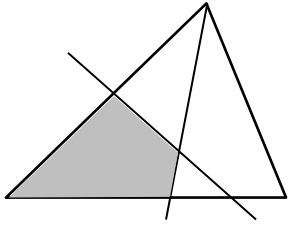
Cambridge will not enter into discussions about these mark schemes.

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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 $\frac{2}{12}$	M1	Equivalent denominators can be used, working **must** be shown.
		$\frac{5}{12}$ cao	A1	
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 $30 - (24 \times 1.2378)$ or $(24 \times 1.2378) - 30$ 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)	$\dfrac{x^2}{3}$	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	$[\pm]$ 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

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** $2 \times their(\mathbf{c})(\mathbf{i})$ 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 $[f(x+2)] = 3(x+2) - 2$