

MARK SCHEME for the October/November 2014 series

0581 MATHEMATICS

0581/21

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
- nfwf 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... nfwf	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)	$\frac{x^2}{3}$	2	B1 for answer kx^2 or $\frac{x^k}{3}$ or $\frac{1}{3}$
12	5 -5 nfw	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	$[\pm] 8$ nfw	3	M1 for $y = k\sqrt{x+5}$ A1 for $k = [\pm] 2$ 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 $[\sin D =] \frac{6 \times \sin \text{their} B}{8}$ oe or M1 for $\frac{6}{\sin D} = \frac{8}{\sin(\text{their} 30)}$ oe A1 for $[D =] 22$ or 22.0 or 22.02... B1FT for $90 + (\text{their} 30 + \text{their} 22)$ evaluated correctly for their final answer or for $360 - 90 - \text{their} BCD$ evaluated correctly for their final answer

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