MARK SCHEME for the October/November 2014 series

0580 MATHEMATICS

0580/21

Paper 2 (Extended), maximum raw mark 70

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Abbreviations

cao	correct answer only
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- 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		$\frac{\frac{3}{12} \text{ and } \frac{2}{12}}{\frac{5}{12} \text{ cao}}$	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 $2.1 \times (1 + \frac{6}{100})^3$ oe or M1 for $2.1 \times (1 + \frac{6}{100})^n$ oe where $n \ge 2$ or for figs $21 \times (1 + \frac{6}{100})^3$ 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

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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 nfww	3	M1 for correctly eliminating one variable A1 for $x = 5$ A1 for $y = -5$ If zero scored SC1 for correct substitution		
13	[±] 8 nfww	3	and evaluation to find the other variable 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 $[\sin D =] \frac{6 \times \sin theirB}{8}$ 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 + (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 $\frac{4}{3} \times \pi \times 5^3$		$\pi \times 5^2 \times 8$
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 <i>their</i> 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 <i>their</i> (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 × <i>their</i> (c)(i) correctly evaluated		
20	(a)	0.4 or $\frac{2}{5}$	2	B1 for $[f(2) =] 4$ or M1 for $\frac{2}{(3x-2)}$	$\frac{1}{1}$ or better	
	(b)	$-0.8 \text{ or } -\frac{4}{5}$	2	M1 for $2 = 10(x+1)$) or better	
	(c)	3x - 6 or $3(x - 2)$ nfww	3	M2 for $3(2x)-2-4$ or M1 for $[f(2x)=]^2$ [f(x+2)]=3(x+2)	3(2x) - 2 or	