MARK SCHEME for the October/November 2013 series

0580 MATHEMATICS

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

Abbreviations
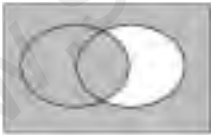
cao	correct answer only
cso	correct solution only
dep	dependent
ft	follow through after error
isw	ignore subsequent working
oe	or equivalent
SC	Special Case
www	without wrong working

Qu.	Answers	Mark	Part Marks
1	86.7 or 86.74 to 86.75	1	
2	5.293 cao	2	**B1** for 5.29 or 5.292 to 5.2927
3	125	2	**B1** for 55 or 125 in any other correct position on diagram or **M1** for 180–55
4	7.7	2	**M1** for $44 \times \dfrac{17.5}{100}$ oe
5	4.8 oe	2	**M1** for $5 + 19 = 3x + 2x$ oe or better or **B1** for $24 - 2x = 3x$ oe or $5 = 5x - 19$ oe
6	(a) $\dfrac{2}{6}$ oe	1	
	(b) 200	1FT	FT $600 \times$ *their* **(a)** providing *their* **(a)** is a probability
7	435, 445 cao	2	**B1** for one value in the correct place or **SC1** for both values correct but reversed
8	134	3	**M2** for $\dfrac{20.1 \times 100}{3 \times 5}$ oe or **M1** for $\dfrac{x \times 3 \times 5}{100} = 20.1$ or 3% = 4.02 oe If 0 scored **SC1** for answer of figs 134
9	(a) $\dfrac{n}{n+2}$ oe final answer	1	
	(b) n^2-1 oe final answer	2	**B1** for any quadratic in final answer
10	$[\pm]\sqrt{c^2 - a^2}$ oe final answer	3	**M1** for correct square **M1** for correct re-arrangement **M1** for correct square root

11	150		3	**M1** for m³ to cm³ or cm³ to m³

12	**(a)** 110		1	
	(b) 79		2	**B1** for $DAC = 42$ or $ACB = 79$ or $ACD = 28$

13	**(a)** $\dfrac{5}{4}$ oe		1	
	(b) $4y^6$		2	B1 for ky^6 or y^6 or $4y^k$ or 4 as final answer

14	$\dfrac{2t-5}{t-1}$ final answer		3	**B1** for $\dfrac{3(t-1)}{t-1}$ or better **B1** for $3(t-1)-(t+2)$ oe or better

15	**(a)** $\dfrac{9}{12}-\dfrac{1}{12}$ oe	**M1**	Must be shown
	$[=]\dfrac{8}{12}$ oe $[=]\dfrac{2}{3}$	**M1**	Both fractions must be shown
	(b) $\dfrac{5}{2}\times\dfrac{4}{25}$ oe	**M1**	Must be shown
	Cancelling shown or $\dfrac{20}{50}$ oe $[=]\dfrac{2}{5}$	**M1**	**Dependent** and cancelling shown or a fraction and then $\dfrac{2}{5}$ must be shown

16	**(a)** $\begin{pmatrix} 9 \\ 6 \end{pmatrix}$	1	
	(b) 10.8 or 10.81 to 10.82	2FT	**M1** for $\sqrt{(their\ 9)^2+(their\ 6)^2}$ **A1** for 10.8 or FT correctly evaluated
	(c) (17, 13)	1FT	FT *their* 9 and 6. $(8 + their\ 9, 7 + their\ 6)$ correctly evaluated

17	**(a)** $(a+b)(1+t)$	2	**B1** for $1(a+b)+t(a+b)$ or $a(1+t)+b(1+t)$
	(b) $(x-6)(x+4)$	2	**SC1** for answer of $(x+a)(x+b)$ where $ab = -24$ or $a+b = -2$

18	486 cao		**M1** for $\dfrac{1}{2}\times 4\pi r^2 + \pi r^2 = 243\pi$ or better **A1** for $[r=]$ 9
		4	**M1** for $\dfrac{1}{2}\times\dfrac{4}{3}[\pi](their\ r)^3$

19	(a) 40	2	**M1** for $\dfrac{144 \times 1000}{60 \times 60}$ oe
	(b) 3.5	2FT	FT 140 ÷ *their* **(a)** **M1** for dist ÷ *their* **(a)** or dist ÷ 40 or dist $\times \dfrac{60 \times 60}{144 \times 1000}$ or **B1** for 140 seen
20	(a) (i) Accurate bisector of angle *B* with correct arcs	2	**B1** for correct line or correct arcs
	(ii) Accurate perpendicular bisector of *BC* with correct arcs	2	**B1** for correct line or correct arcs
	(b) correct region shaded	1	
21	(a) 73.7 or 73.73 to 73.74	3	**M1** for $\dfrac{20}{3+2} \times 2$ or **B1** for $BX = 8$ **M1** for tan [ ] = $\dfrac{6}{their\ 8}$ or better
	(b) **120**	2	**M1** for $\frac{1}{2} \times 20 \times 12$ oe
22	(a) (i) $\dfrac{5}{50}$ oe	1	
	(ii) $\dfrac{11}{50}$ oe	1	
	(b) $\dfrac{11}{16}$ oe	1	
	(c) $\dfrac{380}{2450}$ oe	2	**M1** for $\dfrac{20}{50} \times \dfrac{19}{49}$
	(d)	1	