MARK SCHEME for the May/June 2014 series

0444 MATHEMATICS (US)

0444/21   Paper 2, 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.

Cambridge is publishing the mark schemes for the May/June 2014 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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
soi   seen or implied

Qu.		Answers	Mark	Part Marks
1		$1\frac{1}{4}$ oe	2	**B1** for $\frac{3}{4}$ oe or $\frac{1}{2}$ oe
2		[0]. 06 oe	2	**B1** for [0].05 oe or [0].01 oe
3		30	2	**M1** for $n - 8 = 22$ or $\frac{n}{2} = 15$
4	**(a)**	$\frac{5 \times 2}{20}$	1	
	(b)	0.5 or $\frac{1}{2}$ cao	1	
5	**(a)**	18	1	
	(b)	$5\sqrt{6}$	2	**B1** for $2\sqrt{6}$ or $3\sqrt{6}$
6		20	3	**M1** for 80×1.5 And **M1** for (*their* $120 - 88$) ÷ 1.6
7		$4 \pm \sqrt{y - 6}$	3	**M1** for *their* 6 moved correctly **M1** for *their* √ taken correctly **M1** for *their* 4 moved correctly
8		$\frac{2}{x(x+1)}$	3	**B1** for common denominator $x(x+1)$ seen. **M1** for $2(x + 1) - 2x$ oe or better
9	**(a)**	119	3	**M2** for $18 \times 6 + 11$ oe or **B1** for 18 or 11 or 108
	(b)	[0] 1 [00] pm cao	1	

10	(a)	$(a + b)(x + y)$	2	**B1** for $a(x + y) + b(x + y)$ or $x(a + b) + y(a + b)$
	(b)	$(x - 1)(3x - 2)$	2	**B1** for $(x - 1)(3(x - 1) + 1)$ If **B0** then **SC1** for $(x + a)(3x + b)$ where $3a+b = -5$ or $ab = 2$ or $3(x - 1)(x - ⅔)$
11		$\dfrac{5}{24}$ oe	3	**M2** for $\frac{1}{4} \times \frac{2}{6} + \frac{3}{4} \times \frac{1}{6}$ or better or **M1** for one of these products
12	(a)	2×10^{10}	2	**B1** for 20×10^9 or $20\,000\,000\,000$
	(b)	1.25×10^{-1}	2	**B1** for 0.125 oe
13	(a)	32	2	**B1** for $AOC = 116$
	(b)	35	2	**B1** for $CDA = 122$
14		$y = \dfrac{2}{3}x - 2$ oe	4	**B1** for (9, 4) and **M2** for $y = kx - 2\ (k \neq 0)$ or $y = \frac{2}{3}x + k\ (k \neq 0)$ or $\frac{2}{3}x - 2$ or **M1** for $y = \frac{2}{3}x$ or $\frac{2}{3}x + k\ (k \neq 0)$
15		[0], 1, 2, 3	4	**M1** for moving the 5 correctly **M1** for collecting *their* terms **A1** for a correct inequality for x eg $[0 \leq]\ x < 4$
16	(a)	8	2	**B1** for 2^{12} or 4096
	(b)	$2q^{\frac{3}{2}}$	3	**B2** for $kq^{\frac{3}{2}}$ as the answer or **B1** for $2q^2$ and **B1** for $q^{\frac{1}{2}}$ oe nfww
17	(a)	correct working	2	**M1** for 1 holiday = 5 or $360 \div 72 = 5$ and **B1** for $24 \times 5\ [= 120]$ or **M2** for $\dfrac{24}{72} \times 360\ [=120]$ oe
	(b)	6	3	**M1** for $150 + 120 + x + 2x = 360$ oe **A1** for 30 identified as the required angle

18 (a)	correct working	2	**B2** for $\sqrt[3]{\frac{1}{8}} = \frac{1}{2}$ or $\sqrt[3]{8} = 2$ AND $\frac{10}{2} = 5$ oe and $\frac{4}{2} = 2$ oe or **B1** for $\sqrt[3]{\frac{1}{8}}$ or $\sqrt[3]{8}$ or $8 = 2^3$ or $\frac{1}{8} = (\frac{1}{2})^3$
(b)	56	4	**M3** for $\frac{7}{8} \times \frac{1}{3} \times \pi \times 4^2 \times 12$ oe or **M1** for $\frac{1}{3} \times \pi \times 4^2 \times 12$ oe **M1** for $\frac{1}{3} \times \pi \times 2^2 \times 6$ oe **M1** for subtracting *their* volumes
19	$12 - 4\sqrt{3} + \frac{4}{3}\pi$	7	**B2** for $BC = 4$ or **M1** for $8\cos 60$ oe or **B1** for $\sin 30$ or $\cos 60 = \frac{1}{2}$ or $AE = 4$ and **B2** for $[DC =]$ $8 - 8\frac{\sqrt{3}}{2}$ oe or **M1** for $8 - 8\sin 60$ oe or **B1** for $\sin 60$ or $\cos 30 = \frac{\sqrt{3}}{2}$ or $[DE =] 8\sin 60$ oe and **B2** for $[DB =]$ $\frac{4}{3}\pi$ or **M1** for $\frac{30}{360} \times \pi \times 16$ oe