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CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 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.

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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

Question	Answers	Mark	Part Marks
1	1.37	**2**	**B1** for 0.866… or $\frac{\sqrt{3}}{2}$ or 0.5 or $\frac{1}{2}$ or **B1** for 1.366… as final answer
2	$18\frac{1}{18}$	**2**	**M1** for $\frac{2}{36}+\frac{36}{2}$ or better
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	0.5^3 0.5^2 0.5 $\sqrt[3]{0.5}$	**2**	**B1** for 0.25 , 0.125 and 0.793… seen or for three in correct order
6	1.6[0]	**3**	**M1** for 800 × 1.5 and **M1** for *their* 1200 ÷ 750
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 × 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 $3(x-1)(x-\frac{2}{3})$

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11		113.9 to 114.0	**4**	**M2** for [cos =] $\frac{8^2+2^2-9^2}{2\times8\times2}$ or **M1** for $9^2 = 8^2 + 2^2 - 2 \times 8 \times 2 \times \cos x$ **A1** for –0.406 or –0.4063 to –0.4062 or $-\frac{13}{32}$ If **0** scored **SC2** for 54.3[1…] or 11.7 or 11.71 to 11.72 **SC1** for [cos =] $\frac{9^2+2^2-8^2}{2\times9\times2}$ or [cos =] $\frac{9^2+8^2-2^2}{2\times9\times8}$
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		$y = \frac{2}{3}x - 2$ 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 ÷ 72 = 5 and **B1** for 24 × 5 [= 120] or **M2** for $\frac{24}{72} \times 360$ [=120] oe
	(b)	6 nfww	**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 $\frac{1}{8} = (\frac{1}{2})^3$

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(b)	147 or 146.5 to 146.6…	**4**	**M3** for $\frac{7}{8}\times\frac{1}{3}\times\pi\times4^2\times10$ or **M1** for $\frac{1}{3}\times\pi\times4^2\times10$ and **M1** for $\frac{1}{3}\times\pi\times2^2\times5$ and **M1** for subtracting *their* volumes
19	1.38 or 1.39 or 1.384 to 1.389	**7**	**M3** [Area Δ =] $\frac{1}{2}\times8\cos 60\times8\sin 60$ or **M1** for [*AE* =] 8cos 60 and **M1** for [*ED*] = 8sin 60 and **M1** for Area sector $\frac{30}{360}\times\pi\times8^2$ and **M1** for Area rectangle = 8 × 8cos60 or 8 × 4 **M1** for *their* 32 – (*their* 13.86 + *their* 16.76) or better

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