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.

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
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 $\dfrac{\sqrt{3}}{2}$ or 0.5 or $\dfrac{1}{2}$ or **B1** for 1.366… as final answer
2		$18\dfrac{1}{18}$	2	**M1** for $\dfrac{2}{36}+\dfrac{36}{2}$ or better
3		30	2	**M1** for $n-8=22$ or $\dfrac{n}{2}=15$
4	(a)	$\dfrac{5\times 2}{20}$	1	
	(b)	0.5 or $\dfrac{1}{2}$ 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* $1200\div 750$
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		$\dfrac{2}{x(x+1)}$	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 $3(x-1)(x-\tfrac{2}{3})$

11		113.9 to 114.0	4	**M2** for $[\cos =]\ \dfrac{8^2+2^2-9^2}{2\times 8\times 2}$ 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 $-\dfrac{13}{32}$ If **0** scored **SC2** for 54.3[1…] or 11.7 or 11.71 to 11.72 **SC1** for $[\cos =]\ \dfrac{9^2+2^2-8^2}{2\times 9\times 2}$ or $[\cos =]\dfrac{9^2+8^2-2^2}{2\times 9\times 8}$
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 $y = kx - 2$ ($k \ne 0$) or $y = \dfrac{2}{3}x + k$ ($k \ne 0$) or $\dfrac{2}{3}x - 2$ or **M1** for $y = \dfrac{2}{3}x$ or $\dfrac{2}{3}x + k$ ($k \ne 0$)
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 $[0 \le]\ x < 4$
16	(a)	8	2	**B1** for 2^{12} or 4096
	(b)	$2\,q^{\frac{3}{2}}$	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 24×5 [= 120] or **M2** for $\dfrac{24}{72} \times 360$ [=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 $\sqrt[3]{\dfrac{1}{8}} = \dfrac{1}{2}$ or $\sqrt[3]{8} = 2$ AND $\dfrac{10}{2} = 5$ oe and $\dfrac{4}{2} = 2$ oe or **B1** for $\sqrt[3]{\dfrac{1}{8}}$ or $\sqrt[3]{8}$ or $8 = 2^3$ or $\dfrac{1}{8} = (\dfrac{1}{2})^3$

(b)	147 or 146.5 to 146.6…	**4**	**M3** for $\dfrac{7}{8} \times \dfrac{1}{3} \times \pi \times 4^2 \times 10$ or **M1** for $\dfrac{1}{3} \times \pi \times 4^2 \times 10$ and **M1** for $\dfrac{1}{3} \times \pi \times 2^2 \times 5$ and **M1** for subtracting *their* volumes
19	1.38 or 1.39 or 1.384 to 1.389	**7**	**M3** [Area Δ =] $\dfrac{1}{2} \times 8\cos\ 60 \times 8\sin\ 60$ or **M1** for [*AE* =] 8cos 60 and **M1** for [*ED*] = 8sin 60 and **M1** for Area sector $\dfrac{30}{360} \times \pi \times 8^2$ and **M1** for Area rectangle = 8 × 8cos60 or 8 × 4 **M1** for *their* 32 – (*their* 13.86 + *their* 16.76) or better