

MARK SCHEME for the May/June 2013 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.

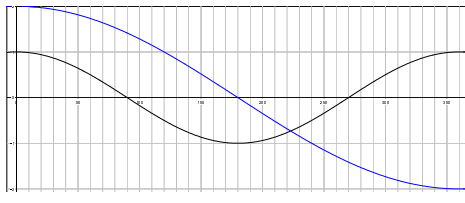
Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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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

1	11 or -11	1	
2 (a)	[0].216	1	
(b)	[0].22	1ft	
3	72	2	M1 for $84 \div 7$
4	105	2	M1 for $180 - 55 - 50$ or B1 for 55 or 75 seen in the correct angle inside the triangle
5	8	2	M1 for $\frac{3k}{2k} \times \frac{16n}{3n}$
6	$3x(4y - x)$ final answer	2	B1 for $3(4xy - x^2)$ or $x(12y - 3x)$
7	Accurate angle with arcs	2	B1 for accurate angle without arcs
8	$x \geq -\frac{3}{8}$ oe	2	M1 for $-3 \leq 8x$ oe If 0 then SC1 for $-\frac{3}{8}$ with incorrect inequality
9	$7\sqrt{5}$	2	B1 for $2\sqrt{5}$ or $5\sqrt{5}$ seen
10	$(a + b)(p - 2)$	2	B1 $p(a + b) - 2(a + b)$ or $a(p - 2) + b(p - 2)$
11	$3x^4$	2	B1 for kx^4 or $3x^k$
12	 Cosine graph, amplitude 2, period 720	2	B1 for cosine graph amplitude 2 or period 720
13	407.6[0]	2	M1 for 200×2.038

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14	3	3	M2 for $r^3 = \frac{3 \times 36 \times \pi}{4 \times \pi}$ oe or better or M1 for $\frac{4}{3}\pi r^3 = 36\pi$
15	3 [min] 20 [sec]	3	M1 for figs $6 \div (1.5 \times 20)$ A1 for 200 [seconds]
16	$y = 2x - 1$	3	B2 for $y = mx - 1$ or $y = 2x + c$ or $2x - 1$ or B1 for gradient = 2, B1 for $c = -1$ or SC1 for $\frac{6}{3}$ or $\frac{5 - -1}{3[-0]}$
17 (a)	$(x + 6)(x - 5)$	2	SC1 for $(x + a)(x + b)$ where $ab = -30$ or $a + b = 1$
(b)	$\frac{x + 4}{x + 6}$ final answer	1	
18	$\frac{6}{7}$ or 0.857[1...]	3	M1 for $t = \frac{k}{\sqrt{u}}$ oe A1 for $k = 6$
19 (a) (i)	$p + \frac{1}{2}r$	1	
(ii)	$2p + r$	1ft	$2 \times$ their (i)
(b)	Midpoint of RQ	1	
20	$9\pi + 24$	3	SC2 for accept 9π If 0 M2 for $\frac{135}{360} \times \pi \times 24 + 2 \times 12$ oe or M1 for $\frac{135}{360} \times \pi \times 24$ oe
21	$\frac{5x + 13}{(x + 3)(x + 2)}$ oe final answer	3	B1 for common denominator $(x + 3)(x + 2)$ seen M1 for $2(x + 2) + 3(x + 3)$ soi
22	$\frac{3}{7}$	4	M3 for $[\sin =] \frac{\sqrt{7^2 - (6^2 + 2^2)}}{7}$ or M2 for $[AC =] \sqrt{7^2 - (6^2 + 2^2)}$ or better or M1 for $6^2 + 2^2$ or better
23 (a)	$\frac{A - 2\pi r^2}{2\pi r}$ or $\frac{A}{2\pi r} - r$ oe final answer	2	M1 for correct first step M1 for correct second step }
(b)	$y = 2^{x+1}$ oe	2	SC1 for $k \times 2^p$, p not numerical

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24	(a)	Any two of $ABX = CDX$ and alternate $BAX = DCX$ and alternate $AXB = CXD$ and vertically opposite	2	B1 for any two without reasons
	(b)		2	M1 for $\frac{CD}{4} = \frac{5}{2}$ oe
		10		
25	(a)	$13 - 5n$	2	B1 for $\pm 5n$ seen
	(b)	$n^2 - 2$	2	B1 for $n^2 + k$
26		420	5	M1 for $[CB =] \sqrt{4^2 + (9 - 6)^2}$ M1 for <i>their</i> CB from Pythagoras $\times 15$ M1 for $[2 \times] \frac{1}{2}(6 + 9) \times 4$ M1 for $4 \times 15, 9 \times 15, 6 \times 15$ with intention to add