CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

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.

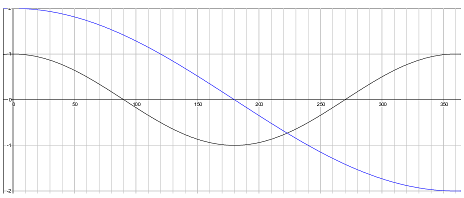
Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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.

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

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

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)	10	**2**	**M1** for $\frac{CD}{4}=\frac{5}{2}$ oe
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 *their CB* from Pythagoras × 15 **M1** for $[2 \times]\ \frac{1}{2}(6+9)\times 4$ **M1** for 4 × 15, 9 × 15, 6 × 15 with intention to add