CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2012 series

0444 MATHEMATICS (US)

0444/23 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 October/November 2012 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
art anything rounding to
soi seen or implied

Qu.	Answers	Mark	Part Marks
1	96	**2**	**M1** for $\frac{600\times2\times8}{100}$ oe. If zero **SC1** 696
2	$\frac{1}{100}+\frac{4}{25}$ or $0.1^2 + 0.4^2$ oe $\frac{1}{100}+\frac{16}{100} = 0.17$ or $0.01 + 0.16 = 0.17$	**M1** **M1**	 Independent
3	180	**2**	**M1** for $\frac{300\times12}{20}$ oe
4	$3y - y^4$ final answer	**2**	**B1** for $3y$ or $-y^4$ as part of 2 term expression
5	88.2(0)	**2**	**M1** for 84×1.05 oe
6	2.5	**2**	**M1** for relevant distance / relevant time, e.g. 250/6
7	4	**2**	**B1** for 1.8 seen
8	$x \geqslant -2$ or $-2 \leqslant x$ oe	**2**	**B1** for $-7 + 3 \leqslant 2x$ oe or better
9	Correct working seen	**M1** **M1**	Correct step Correct step
10	$4w^{64}$	**2**	**B1** for $4w^n$ or kw^{64}
11	(6, 2)	**1,1**	**B1, B1** If B0, **M1** for (2, –1) + (4, 3) soi **SC1** for *B* (10, 5)
12	40 6	**2**	**B1** for one correct
13 (a)	**(i)** $\frac{20}{100}$ oe	**1**	
	(ii) $\frac{90}{100}$ oe	**1**	
(b)	80	**1**	

14	3, –3 or ±3	**3**	**M1** for $y = k/\sqrt{x}$ oe **A1** for 18
15	3600	**3**	**M2** for 4 × 900 oe **B1** for figs 36
16	$\sqrt{\frac{\pi x^2 - A}{\pi}}$ oe	**3**	**M1** for one correct move **M1** for second correct move **M1** for third correct move
17 (a)	150n	**1**	
(b)	3, 4, 6, 7	**2**	**B1** for 3 out of 4 correct or 3 4 5 6 7
18	$10r^2$ cao WWW	**3**	**B1** for $\left(\frac{\theta}{360} =\right) \frac{4r}{2 \times \pi 5r}$ **M1** for $\frac{4r}{2\pi 5r} \times (5r)^2 \pi$
19 (a)	$\frac{1}{3}(c-d)$ oe	**2**	**M1** for $\overrightarrow{DC} = c - d$ oe or correct route
(b)	$\frac{1}{3}c + \frac{2}{3}d$ oe	**2ft**	Their **(a)** + d simplified **M1** for any correct route from O to E stated
20 (a)	$\frac{x}{x-1}$ final answer	**2**	**M1** for $\frac{1+x-1}{x-1}$ oe
(b)	$\frac{23-2x}{12}$	**3**	**M1** for two correct algebraic fractions with a common denominator of 12 **M1** for correctly collecting their terms **M1** for dealing correctly with the 1
21	$h + 4$ $h + 5$	**4**	**B2** for $(h – 5)(h + 4)$ seen **B1** for $(h – 5)(h + 5)$ If **B2** not scored then **SC1** for $(h + a)(h + b)$ where $a + b = –1$ or $ab = –20$
22 (a)	0.5	**2**	**M1** for $\frac{\sin A}{15} = \frac{0.2}{6}$ oe or better
(b)	150	**2**	**B1** for 30 seen
23 (a)	43	**2**	**M1** for $g(11)$ or $4[4(3) – 1] – 1$
(b)	$12x + 2$	**2**	**M1** for $3(4x – 1) + 5$
(c)	38	**1**	

24 (a)	7	**3**	**M2** for $6^2+2^2+3^2$ or better or **M1** for one of 6^2+2^2 or 2^2+3^2 or 6^2+3^2
(b)	$36+6\sqrt{13}$	**3**	**M2** for correct area statement $6\times3+6\times2+\frac{2\times3}{2}\times2+6\times\sqrt{13}$ Or **M1** for two correct areas