

MARK SCHEME for the October/November 2013 series

0444 MATHEMATICS (US)

0444/21

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 October/November 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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Abbreviations

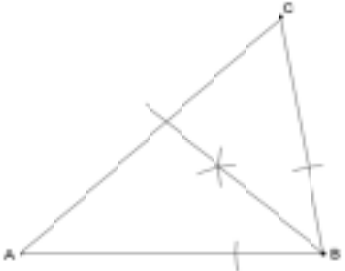
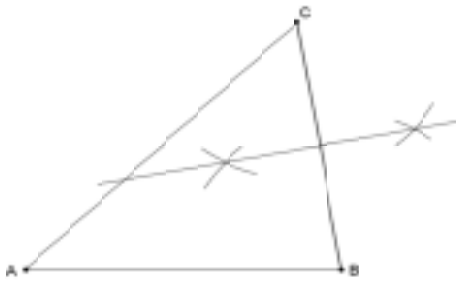
cao	correct answer only
cso	correct solution only
dep	dependent
ft	follow through after error
isw	ignore subsequent working
oe	or equivalent
SC	Special Case
www	without wrong working

Qu	Answer	Mark	Part marks
1	80	1	
2	2.5 oe	2	B1 for 0.5/0.2
3	125	2	B1 for 55 or 125 in any other correct position on diagram or M1 for 180 – 55
4	6.8	2	M1 for 40×0.17 oe
5	4.8 oe	2	M1 for $5 + 19 = 3x + 2x$ oe or better or B1 for $24 - 2x = 3x$ oe or $5 = 5x - 19$ oe
6 (a)	$\frac{2}{6}$ oe	1	
(b)	200	1FT	FT $600 \times$ <i>their (a)</i> providing <i>their (a)</i> is a probability
7	9×10^{12}	2	B1 for correct answer but not in scientific notation e.g. 0.9×10^{13} or M1 for 11×10^{12} or 0.2×10^{13}
8	3 120	1 1	
9	130	3	M2 for $\frac{26 \times 100}{4 \times 5}$ oe or M1 for $\frac{x \times 4 \times 5}{100} = 26$ or $4\% = 5.2$ oe If 0 scored SC1 for figs 130
10 (a)	$\frac{n}{n+2}$ final answer	1	
(b)	$n^2 - 1$ oe final answer	2	B1 for any quadratic in final answer

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11	$[\pm] \sqrt{c^2 - a^2}$ final answer	3	M1 for correct square M1 for correct re-arrangement M1 for correct square root
12	40	3	M1 for m^2 to cm^2 or cm^2 to m^2 M1 for square root of $\frac{\text{figs } 32}{\text{figs } 2}$ or $\frac{\text{figs } 2}{\text{figs } 32}$
13 (a)	110	1	
(b)	79 cao	2	B1 for $DAC = 42$ or $ACB = 79$ or $ACD = 28$
14 (a)	$\frac{5}{4}$ oe	1	
(b)	$4y^6$	2	B1 for ky^6 or y^6 or $4y^k$ or 4 as final answer
15	$\frac{2t-5}{t-1}$ cao final answer	3	B1 for $\frac{3(t-1)}{t-1}$ or better B1 for $3(t-1) - (t+2)$ oe or better If 0 scored SC1 for $\frac{3t-1-t-2}{t-1}$ oe or better
16 (a)	$\frac{2}{3}$	2	M1 for $\frac{9}{12} - \frac{1}{12}$ oe
(b)	$\frac{2}{5}$	2	M1 for $\frac{5}{2} \times \frac{4}{25}$ oe
17 (a)	$\begin{pmatrix} 8 \\ 6 \end{pmatrix}$	1	
(b)	10	2	M1 for $(\text{their } 8)^2 + (\text{their } 6)^2$
(c)	(15, 13)	1FT	FT <i>their</i> 8 and 6. (7 + <i>their</i> 8, 7 + <i>their</i> 6) correctly evaluated
18 (a)	$(a+b)(1+t)$	2	B1 for $1(a+b) + t(a+b)$ or $a(1+t) + b(1+t)$
(b)	$(x-6)(x+4)$	2	SC1 for answer of $(x+a)(x+b)$ where $ab = -24$ or $a+b = -2$
19	486 cao	4	M1 for $\frac{1}{2} \times 4\pi^2 + \pi^2 = 243\pi$ or better A1 for $[r=] 9$ M1 for $\frac{1}{2} \times \frac{4}{3} [\pi] (\text{their } r)^3$

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20 (a)	20	2	M1 for $72 \times 1000 \div 60 \div 60$ o.e.
(b)	7	2FT	FT 140 \div <i>their</i> (a) M1 for dist \div <i>their</i> (a) or dist \div 20 or dist \div $72 \times 1000 \div 60 \div 60$ or B1 for 140 seen
21 (a)		2	B2 for correct bisector with correct arcs or B1 for correct bisector with no arcs
(b)		2	B2 for correct bisector with correct arcs or B1 for correct bisector with no arcs
22 (a)	150	2	M1 for $\frac{1}{2} \times 25 \times 12$ o.e.
(b)	$2\sqrt{3}$	3	M1 for $\tan 60 = \frac{6}{BX}$ oe or better B1 for $\tan 60 = \sqrt{3}$ or $\tan 30 = \frac{1}{\sqrt{3}}$ o.e.
23 (a)	$\frac{56}{110}$ oe	3	M2 for $\frac{4}{11} \times \frac{7}{10} + \frac{7}{11} \times \frac{4}{10}$ o.e. M1 for one of these products
(b)	$\frac{168}{990}$ oe	2	M1 for $\frac{7}{11} \times \frac{6}{10} \times \frac{4}{9}$