CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2013 series

0444 MATHEMATICS (US)

0444/31 Paper 3 (Core), maximum raw mark 104

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.

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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.	Answers	Mark	Part Marks
1 (a) (i)	2, 3, 4, 5, 6, 8, 10, 12, 15, 20, 24, 30, 40, 60.	**1**	Award mark for any one from list.
(ii)	60	**2**	**B1** for any common factor on answer line, 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30
(b) (i)	60	**1**	
(ii)	49	**1**	
(iii)	2	**1**	
(c) (i)	Any correct example	**1**	Calculation and correct answer must be seen.
(ii)	Any correct example	**1**	Calculation and correct answer must be seen.
(d) (i)	>	**1**	
(ii)	>	**1**	
(iii)	<	**1**	
2 (a)	7 (hours) 25 (minutes) cao	**1**	
(b) (i)	128.42	**2**	**M1** for 167×0.769 soi by 128.423 or 128.4 or 128
(ii)	80	**2**	**M1** for $61.52 \div 0.769$
(c)	20	**3**	**M2** for $\frac{10}{\sin 30}$ or **M1** for $\sin 30 \frac{10}{BC}$
(d)	52.[0] or 51.99	**4**	**B1** for 73900 seen **M2** for $r^3 = \frac{3 \times \text{their } 73600}{4\pi}$ oe imp by 17563 to 17580. Or **M1** for $\frac{4}{3}\pi r^3 = \textit{their } 76300$ oe

3 (a) (i)	44–46	**1**	
(ii)	213–235	**1**	
(b) (i)	Fully correct drawing with arcs	**3**	**B2** for correct triangle without arcs Or **B1** for 1 correct length side Or arc of 6cm or 8cm
(ii)	52250 to 60500 **nfww**	**3FT**	**M2** for $\frac{1}{2} \times 550 \times$ (*their* correct height × 50) Or $\frac{1}{2} \times 11 \times$ *their* correct height in cm Or **B1** for *their* correct height in cm or *their* correct height × 50 seen If 0 scored then **SC1** for $\frac{1}{2} \times 550 \times (50 \times k)$
4 (a) (i)	Translation $\begin{bmatrix} -7 \\ -8 \end{bmatrix}$	**1** **1**	 Accept 7 left and 8 down
(ii)	Enlargement [Scale factor] 0.5 [Centre] (0, 0)	**1** **1** **1**	
(b) (i)	D at (–2, 4) (–4, 4) (–3, 6)	**1**	
(ii)	E at (–4, 2) (–4, 4) (–6, 3)	**2**	**B1** for correct orientation, incorrect centre or 90° rotation clockwise about (0, 0).
5 (a)	252.56	**2**	**M1** for (30 + 30 + 17) × 3.28 or better oe
(b) (i)	510	**2**	**M1** for 30 × 17
(ii)	170 102 136	**3**	**M2** for 2 correct areas clearly identified or **M1** for 408 ÷ (5 + 3 + 4) soi by 34 or one correct area clearly identified **SC2** for three correct answers in incorrect places
(c)	34.5	**3**	**M2** for $\sqrt{30^2 + 17^2}$ soi by $\sqrt{1189}$ or **M1** for $30^2 + 17^2$ soi by 1189
(d) (i)	63.6 or 63.61–63.63	**2**	**M1** for $4.5^2 \times \pi$ or 20.25π
(ii)	127 or 127.2…	**1FT**	**FT** for *their* **(d)(i)** × 2

6 (a)	14, 4, 2, 8, 14	**3**	**B2** for 4 correct **B1** for 2 or 3 correct
(b)	8 points correctly plotted	**P3FT**	**P2FT** for 6 or 7 points correctly plotted **P1FT** for 4 or 5 points correctly plotted
	Smooth and correct curve through all correct points	**C1**	
(c)	$x = 0.5$ or $x = \frac{1}{2}$	**1**	
(d) (i)	$y = 9$ ruled	**1**	
(ii)	–2.15 to –2.25 3.15 to 3.25	**1FT** **1FT**	
7 (a) (i)	July or Jul	**1**	
(ii)	10.9	**1**	
(iii)	–9.6	**1**	
(b) (i)	$150 \div \frac{90}{360}$ oe	**1**	Accept $150 \times \frac{360}{90}$, 150 × 4
(ii)	250	**3**	**M1** for *their* $\frac{150}{360} \times 600$ or *their* $150 \times \frac{150}{90}$ and **B1** for 150 seen as angle
(c)	11682	**3**	**M2** for 885 × 15 × 0.88 oe **M1** for 885 × 0.88 oe or 885 ×15 × 0.12 oe
(d) (i)	4.48×10^6 cao	**1**	
(ii)	9.82	**3**	**M2** for $\frac{4920000 - 4480000}{4480000} \times 100$ oe or $\left(\frac{4920000}{4480000} - 1\right) \times 100$ oe or **B1** for 440000 or 0.44 or 1.098(…) or 109.8(…)

8 (a) (i)	Chord Radius	**1** **1**	
(ii)	12 Tangent [meets] radius [at] 90[°]	**1** **1**	
(iii)	66	**2**	**M1** for BCD identified as 90 or 180–24–90
	Angles [in] triangle 180 or Angle [in a] semi-circle [=90]	**1**	
(b) (i)	Octagon	**1**	
(ii)	360 ÷ 8 [= 45]	**M1**	alternative method **M1** for (8–2) × 180 [=1080] or 6 × 180 [= 1080]
	(180 – their 45) ÷ 2 67.5	**M1FT** **A1**	**M1FT** for (their 1080 ÷ 8) ÷ 2 or *their* 1080 ÷ 16 **A1** for 67.5
(c)	15	**2**	**M1** for 360/24
9 (a) (i)	230	**2**	**M1** for 130 + 4 × 25 or better
(ii)	252	**2**	**M1** for $4n = 1138 - 130$ or better Or $\frac{(1138-130)}{4}$ or better
(b) (i)	9	**1**	
(ii)	3.5	**2**	**M1** for $8y = 24 + 4$ or better Or $y - \frac{4}{8} = \frac{24}{8}$ or better
(iii)	4	**3**	**M1** for first correct step **M1FT** for second correct step
(c)	$x = 1.5$ or 3/2 $y = -5$	**4**	**M1** for correctly equating one set of coefficients. **M1** for correct method to eliminate one variable. **A1** for $x = 1.5$ **A1** for $y = -5$