CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2013 series

0444 MATHEMATICS (US)

0444/33

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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F	Page 2	Mark Scheme	Syllabus	2
		IGCSE – October/November 2013	0444	No.
Abbre	eviations			Carry
cao correct answer only				D.
cso correct solution only		lution only		SE I
dep	dep dependent			, die
ft	follow thr	ough after error		On
isw	ignore sub	osequent working		
oe	or equival	ent		

Abbreviations

oe SCSpecial Case

without wrong working www

Qu	Part	Answers	Mark	Part Marks
1	(a)	(i) 40 (ii) 140	2 1FT	M1 for 360 ÷ 9 180 – their (a)(i)
	(b)	(i) $[w =] 90$ (ii) $[x =] 24$ (iii) $[y =] 66$	1 1 1FT	$180 - (their \ w + their \ x)$
	(c)	[$z = $] 66 [Angle between] tangent [and] diameter/radius [=] 90°	1FT 1	(90 - their x) or their y
2	(a)	240 900 [Total] 1640	1, 1 1FT	500 + <i>their</i> 2 costs
	(b)	(i) $600 \div 5 \times 17$	M2	M1 for 600 ÷ 5 or 17 ÷ 5
		(ii) 30	2	M1 for 2040 ÷ 17 × 3 or 120 × 3, soi by 360 or SC1 for <i>their</i> 360 ÷ 12
	(c)	43.1	2	M1 for $\frac{2920 - 2040}{2040} \times 100$ oe or $\left(\frac{2920}{2040} - 1\right) \times 100$ oe or $\frac{2920}{2040} \times 100 - 100$ oe
	(d)	261.36 cao	3	M1 for 1500 × 1.055³ oe M1FT for their 1761.36 – 1500 If only 1 scored SC1 for correctly rounding to 2 decimal places from at least 3 decimal places SC2 if only 1761.32 seen

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Page 3	Mark Scheme	Syllabus	.0	r
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				3
3	(a)	Kite	1	May
	(b)	(i) Rotation 90° clockwise (or 270° anti-clockwise) oe [centre] origin oe	1 1 1	Cambridge.co.
		(ii) Translation $\begin{pmatrix} -2 \\ -10 \end{pmatrix}$	1	Accept 2 left and 10 down oe
		(iii) Enlargement [Scale Factor] -3 [centre] (-3,4)	1 1 1	
	(c)	(i) $[x2=] \frac{3^2+1^2}{[x=] \sqrt{3^2+1^2}}$ or $[x=] \sqrt{9+1}$ or $\sqrt{10}$	M1	M1 for $3^2 + 1^2$ or better Needs a value to 3 or more decimal place
		and = 3.162	M1dep	
		(ii) 9.15	3	B1 for $\sqrt{2}$ or 1.41 or better seen M1 for $2 \times 3.16 + 2 \times their$ 1.41 soi by 9.14 If zero scored SC1 if answer in range 8.6 to 9.6
		(iii) 27.45 to 27.5	1FT	<i>their</i> (c) (ii) × 3
4	(a)	2.82 or 2.816 to 2.817	2	M1 for $\frac{h}{6} = \sin 28$ or better
	(b)	2.23 or 2.232 to 2.233	3	M2 for $2 \times 2 - \pi \times 0.75 \times 0.75$ OR M1 for 2×2 or $\pi \times 0.75 \times 0.75$ seen.
		m^2	1	
	(c)	(i) justification using proportions or trigonometry for example	1	e.g. same scale factor (must have same oe)
		(ii) $\frac{4}{3}$ or $\frac{3}{4}$	1	allow decimals

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			_	3
5	(a)	(i) 1, 7, 1	1, 1, 1	Mark
		(ii) 8 points correctly plotted	P3FT	P2FT for 6 or 7 correct P1FT for 4 or 5 correct
		Correct smooth curve through all 8 correct points	C 1	
	(b)	−1.1 to −1.3 and 4.1 to 4.3	1FT, 1FT	
	(c)	(i) Line $x = 1.5$ drawn	1	Equation of <i>their</i> line in (c)(i)
		(ii) $x = 1.5$ oe	1FT	
	(d)	(i) Ruled continuous line drawn	1	
		(iii) 1	2	M1 for $\frac{rise}{run}$ for their line
		(iii) $[y =] x + 2$	1FT	their (d) (ii) + their 2
6	(a)	(i) 18	2	M1 for evidence of ordering
		(ii) 7	1	
		(iii) 25	2	M1 for sum of 15 items ÷ 15 soi
	(b)	Alison with reference to [higher] mean and Bethan with reference to [higher] median	1FT 1FT	Strict FT Strict FT
	(c)	(i) [Frequencies] 3, 2, 1 [Angles] 72°, 48°, 24°	1 2	B1 for 1 correct or M1 for one frequency ÷ 15 × 360 or × 24
		(ii) Two correct sectors on pie chart	2FT	B1FT for 1 correct sector Only FT if (c)(i) angles total 144
	(d)	3 'correct' labels	1	Independent
		$\frac{2}{5}$	2	B1 for 0.4 or 40% or $\frac{6}{15}$ or any equivalent fraction.

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1			1	6
7	(a)	[Angle DCE =] 36.9 or 36.8699 to 36.9	3	B1 for [DE =] 0.75 soi M1 for tan DCE = $\frac{their DE}{1.0}$ M1 for $0.5 \times (1.5 + 2.25) \times 1.0$ oe
	(b)	1.875 or 1.88	2	M1 for $0.5 \times (1.5 + 2.25) \times 1.0$ oe
	(c)	3.75	1FT	<i>their</i> (b) × 2
	(d)	(i) 0.96	1	
		(ii) 10	2	M1 for 0.04 × 250 or 0.96 × 250
8	(a)	Octagon	1	
	(b)	[Pattern 3] 20 and 22 [Pattern 4] 26, 29 [Pattern 7] 44, 50	1 1, 1 1, 1	
	(c)	(i) $6n + 2$ oe final answer	2	B1 for $6n + a$ or $bn + 2$ $b \ne 0$
		(ii) 140	1FT	ft linear expression in (c) (i)
	(d)	7n + 1 oe final answer	2	B1 for $7n + c$ or $dn + 1$ $d \neq 0$
	(e)	n-1 final answer	2FT	B1FT for $n + j$ or $kn - 1$ $k \neq 0$
9	(a)	(i) $[r=] \sqrt{\frac{3V}{\pi h}}$	2	B1 for $[r^2 =] \frac{3V}{\pi}$ or $\frac{3V}{h}$ seen or better.
		(ii) $ [r=] \sqrt{\frac{3x141}{\pi x15}} $	M1FT	their formula
	(b)	[r=] 2.99	A1	
	(c)	18.9 or 18.8 or 18.849 to 18.852	2	M1 for $2 \times \pi \times 3$ oe
		1.9 [cents] cao	3	M1 for 2.15 (or 215) ÷ 113 A1 for 0.019(0) or 1.9(0) soi