CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2013 series

0580 MATHEMATICS

0580/33 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.

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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.	Part	Answers	Mark	Part Marks
1	(a)	240 900 [Total] 1640	1,1 1FT	 500 + *their* 2 costs
	(b)	(i) 600 ÷ 5 × 17	M2	**M1** for 600 ÷ 5 or 17 ÷ 5
		(ii) 30	2	**M1** for 2040 ÷ 17 × 3 Or 120 × 3, soi by 360
	(c)	43.1	2	**M1** for $\frac{2920-2040}{2040}\times 100$ oe or $(\frac{2920}{2040}-1)\times 100$ oe or $\frac{2920}{2040}\times 100-100$ oe
	(d)	261.36 cao	3	**M1** for 1500×1.055^3 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 1761.36 seen
2	(a)	Kite	1	
	(b)	(i) Rotation 90° clockwise (or 270° anti-clockwise) oe [centre] origin oe	1 1 1	
		(ii) Translation $\begin{pmatrix}-2\\-10\end{pmatrix}$	1 1	Accept 2 left and 10 down oe

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		(iii) Enlargement [Scale Factor] –3 [centre] (–3, 4)	**1** **1** **1**	
	(c)	**(i)** $[x^2 =] 3^2 + 1^2$ $[x =] \sqrt{3^2} + 1^2$ or $[x = \sqrt{9+1}$ or $\sqrt{10}$ and = 3.162…	**M1** **M1dep**	**M1** for $3^2 + 1^2$ or better Needs a value to 3 or more decimal places
		(ii) 9.15	**3**	**B1** for $\sqrt{2}$ or 1.41 or better seen **M1** for 2 *x* 3.16 + 2 *x 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**	*their* **(c)(ii)** ×3
3	**(a)**	**(i)** 28	**1**	
		(ii) 25 or 49 or 9 or 1	**1**	
		(iii) 2	**1**	
		(iv) 19 or 29	**1**	
	(b)	**(i)** 5	**1**	**B1** for $\frac{1}{8}$ or 216 seen
		(ii) 27	**2**	
4	**(a)**	**(i)** 40	**2**	**M1** for 360 ÷ 9
		(ii) 140	**1FT**	180 – *their* **(a)(i)**
	(b)	**(i)** [*w* =] 90	**1**	
		(ii) [*x* =] 24	**1**	
		(iii) [*y* =] 66	**1FT**	180 – (*their w* + *their x*)
	(c)	[*z* =] 66 [Angle between] tangent [and] diameter/radius [=] 90°	**1FT** **1**	(90 – *their x*) or *their y*
5	**(a)**	**(i)** 1, 7, 1	**1, 1, 1**	
		(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	**C1**	

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	(b)	–1.1 to –1.3 and 4.1 to 4.3	**1FT, 1FT**	
	(c)	**(i)** Line $x = 1.5$ drawn	**1**	
		(ii) $x = 1.5$ oe	**1FT**	Equation of *their* line in **(c)(i)**
	(d)	**(i)** Ruled continuous line drawn	**1**	
		(ii) 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
		3 'correct' labels	**1**	Independent
	(d)	$\frac{2}{5}$	**2**	B1 for 0.4 or 40% or $\frac{6}{15}$ or any equivalent fraction
7	**(a)**	[Angle DCE =] 36.9 or 36.8699 to 36.9	**3**	**B1** for $[DE =]$ 0.75 soi **M1** for than $DCE = \frac{their\ DE}{1.0}$
	(b)	1.875 or 1.88	**2**	**M1** for 0.5 × (1.5 + 2.25) × 1.0 oe
	(c)	3.75	**1FT**	*their* **(b)** × 2

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	(d)	3 rectangles and 1 trapezium correctly placed on the grid with correct scale and size.	**4**	**B1** for rectangle to right 6 by 8 squares **B1** for an accurate and correctly placed trapezium **B1** for a rectangle to left 9 by 8 squares **B1** for rectangle 5 by 8 squares and further to the left
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 $bn + 2$ $b \neq 0$
		(ii) 140 oe	**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
		[r =] 2.99…	**A1**	
	(b)	18.9 or 18.8 or 18.849 to 18.852	**2**	**M1** for $2 \times \pi \times 3$ oe
	(c)	1.9 [cents] cao	**3**	**M1** for 2,15 (or 215) ÷ 113 **A1** for 0.019 (0…) or 1.9 (0…) soi

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