CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2014 series

0580 MATHEMATICS

0580/33 Paper 3 (Paper 3), maximum raw mark 104

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Abbreviations

cao correct answer only
dep dependent
FT follow through after error
isw ignore subsequent working
oe or equivalent
SC Special Case
nfww not from wrong working
soi seen or implied

Qu.		Answers	Mark	Part Marks
1	(a) (i)	reflection	1	
		$y = -x$ oe	1	
	(ii)	rotation	1	
		[centre] (3, 2)	1	
		90° anticlockwise oe	1	
	(iii)	Enlargement	1	
		[Scale factor] 2	1	
		[Centre] (3,–3)	1	
	(b) (i)	shaded square correct	1	
	(ii)	Correct reflection	2	**B1** for 7 or 8 corners correctly marked
2	(a) (i)	23.55, 23.65	2	**B1** for 1 correct or both in reverse order
	(ii)	9.2[0]	2	**M1** for 8 × 1.15 oe
	(iii)	12.5	1	
	(iv)	28.8	2	**M1** for $8 \times \frac{60 \times 60}{1000}$ or better
	(b) (i)	4 points correct	2	**B1** for 3 correct
	(ii)	Negative	1	
	(iii)	the longer the distance, the quicker the time oe	1	Or the shorter the distance the longer the time oe
	(iv)	continuous ruled line of best fit	1	Dependent on at least 9 points on graph
	(v)	17.0 to 17.5	1FT	FT dependent on negative line
	(vi)	Outside the range [of the data] oe	1	

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3	**(a)**	22.5[0]	**3**	**M1** for $(2 \times 8.5 + 6 + 4.50)$ **M1** for 50 – their total
	(b)	[0]9 45	**1**	
	(c)	104	**1**	
	(d) (i)	27	**2**	**M1** for $\frac{45}{5} \times 3$
	(ii)	2 : 3 cao	**2**	**M1** for (their 27 + 3) : 45 or better If zero **SC1** for 3 : 2
	(e)	5	**3**	**M1** for $\frac{85-25}{7.50}$ soi by 8 **M1** for $\frac{their\ 8}{2} + 1$
	(f)	3.75, 3.57... 3.61... [g/c] small [bag]	**3**	**M1** for 1 correct division, not evaluated **M1** for 2 further consistent correct divisions, not evaluated
	(g) (i)	105	**1**	
	(ii)	correct locus drawn	**2**	**M1** for any arc centre exit
	(iii)	S marked correctly	**3**	**B1** for indication of bearing of 212° **B1** for indication of bearing of 293°
4	**(a)**	Frequencies 3, 5, 6, 1	**2**	**B1** for 4 frequencies adding to 15 and at least two correct values or **B1** for three correct values **SC1** for fully correct tallies and nothing in frequency column.
	(b) (i)	3	**1**	
	(ii)	12	**1**	
	(iii)	11	**1**	
	(iv)	11.3 (…)	**2**	**M1** for $(10 \times$ *their* $3 + 11 \times$ *their* $5 + 12 \times$ *their* 6 $+ 13 \times$ *their* $1) \div 15$
	(c) (i)	$\frac{3}{15}$ or $\frac{1}{5}$ or 0.2	**1FT**	isw
	(ii)	0	**1**	

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5	**(a) (i)**	one of e.g. cone, sphere, pyramid	**1**	
	(ii)	Ah	**1**	
	(b) (i)	339	**2**	**M1** $\pi \times 3^2 \times 12$
	(ii)	1.2 cao	**4**	**M2 FT** for $\frac{\textit{their}\ 339 - 160}{150}$ soi or **M1 FT** for *their* 339 – 160 soi **A1** for 1.19... If **A0** scored then **B1** for correct rounding of their 3 sig fig or more answer.
	(iii)	$r = \sqrt{\frac{v}{\pi h}}$	**2**	**M1** for $r^2 = \frac{v}{\pi h}$
6	**(a) (i)**	$y = 5$ drawn	**1**	
	(ii)	$x = -3$ drawn	**1**	
	(b) (i)	(–3, 5) cao	**1**	
	(ii)	$y = k$ oe	**1**	$k \neq 5$
	(c) (i)	10, –2 –2, 10	**2**	**B1** for 3 correct
	(ii)	8 correct points plotted	**3FT**	**B2 FT** for 6 or 7 correctly plotted points or **B1 FT** for 4 or 5 correctly plotted points
		correct curve drawn	**1**	For smooth correct curve, going below $y = -2$
	(iii)	(1.5 cao, k)	**1**	where $-2.5 < k < -2$

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7	**(a) (i)**	$2x$ $x - 8$	**1, 1**	
	(ii)	$x + 2x + x - 8 = 40$ or better	**1FT**	**FT** if algebraic
	(iii)	12 cao	**2**	**M1 FT** for ax = b and a and b not zero
	(b)	195 cao	**4**	**B1** for 75 **B1** for 150 **B1** for 180
	(c)	178.65 or 178.7 or 179	**3**	**M2** for 150×1.06^3 oe or **M1** for $150 \times 1.06 \times 1.06$
	(d) (i)	Add 4 oe	**1**	
	(ii)	$4n - 3$ oe, final answer	**2**	**M1** for $4n$ + k (k not -3), qn–3 (q not 0 or 4) seen
8	**(a)**	6	**2**	**M1** for $\frac{30 \times 2}{10}$ oe or better
	(b) (i)	Trapezium	**1**	
	(ii)	77	**2**	**M1** for $\frac{(14+8)}{2} \times 7$ oe
	(c)	[40], 40, 100	**1, 1**	
9	**(a)**	Angle [in the] semi-circle [equals 90°]	**1**	
	(b)	12	**3**	**M2** for $[BC == \sqrt{(13^2 - 5^2)}$ or better or **M1** for $5^2 + BC^2 = 13^2$ or better
	(c)	22.6	**2**	**M1FT** for $\tan^{-1} \frac{5}{their\,12}$ or **M1** for $\sin^{-1} \frac{5}{13}$ or **M1FT** for $\cos^{-1} \frac{their\,12}{13}$

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