CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2014 series

0581 MATHEMATICS

0581/33   Paper 3 (Paper 3), 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.

Cambridge will not enter into discussions about these mark schemes.

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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 $y = -x$ oe	1 1	
		(ii)	rotation [centre] (3, 2) 90° anticlockwise oe	1 1 1	
		(iii)	Enlargement [Scale factor] 2 [Centre] (3,–3)	1 1 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 $8 \times \dfrac{60 \times 60}{1000}$ 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	

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 $\dfrac{45}{5} \times 3$
	(ii)	2 : 3 cao	2	**M1** for (their 27 + 3) : 45 or better If zero **SC1** for 3 : 2
	(e)	5	3	**M1** for $\dfrac{85-25}{7.50}$ soi by 8 **M1** for $\dfrac{their\ 8}{2}+1$
	(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)	$\dfrac{3}{15}$ or $\dfrac{1}{5}$ or 0.2	1FT	isw
	(ii)	0	1	

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 $\frac{their\ 339 - 160}{150}$ 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)	$r = \sqrt{\dfrac{v}{\pi h}}$	2	**M1** for $r^2 = \dfrac{v}{\pi h}$
6	(a)	(i)	*y* = 5 drawn	1	
		(ii)	*x* = –3 drawn	1	
	(b)	(i)	(–3, 5) cao	1	
		(ii)	*y* = k oe	1	k ≠ 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

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 $\dfrac{30 \times 2}{10}$ oe or better
	(b)	(i)	Trapezium	1	
		(ii)	77	2	**M1** for $\dfrac{(14 + 8)}{2} \times 7$ 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 $\tan^{-1} \dfrac{5}{their\,12}$ or **M1** for $\sin^{-1} \dfrac{5}{13}$ or **M1FT** for $\cos^{-1} \dfrac{their\,12}{13}$