CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2013 series

0581 MATHEMATICS

0581/32 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.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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
soi seen or implied

Qu.	Answers	Mark	Part Marks
1 (a) (i)	7.2 oe	2	**M1** for (3 + 5 + 8 + 10 + 10)/5 or 36/5
(ii)	10	1	
(iii)	8	1	
(iv)	7	1	
(v)	Mode	1	
(b) (i)	$\frac{8}{24}$ oe	1	Must be a fraction
(ii)	$\frac{17}{24}$	1	**SC1** for bi and bii both given as decimals only i.e. 0.333(…..) and 0.708(….)
(c)	45°	2	**M1** for 360 × 3/24 or better seen
2 (a) (i)	$3m$	1	
(ii)	$m + 4$	1	
(b) (i)	$m + 3m + m + 4 = 84$ oe isw	1ft	ft m + (a)(i) + (a)(ii) = 84 if and only if (a)(i) and (a)(ii) are both in terms of m
(ii)	16	2	**M1ft** for "5"m = "80" i.e. pm = q (could be seen in bi) May be implied by a correct answer
(c)	50	2	**M1** for 4.2/84 × 1000 or better **SC1** for figs '5' or 4200 seen
(d)	[Shireen =] 14 [Nazaneen =] 49 [Karly =] 21	1 1 1	**if M0 then M1** for 84/(2 + 7 + 3) or better **and / or** **SC1** 3 correct answers in wrong order.

3	**(a) (i)**	6 cao	2	**M1** for 735/120 oe implied **or SC1** for figs '61....'
	(ii)	47.5	1	
	(b) (i)	55 ---- 70 ---- 25 90 120 ---- ---	2	**M1** for 3 or 4 correct numbers
	(ii)	$\frac{3}{8}$ cao	2	**B1** for $\frac{15}{40}$ or $\frac{3}{8}$ seen
	(c) (i)	20	3	**B1** for 6.6 - 5.5 or better **M1** for 'their 1.1' / 5.5 **OR** (an alternative method) **M1** for 6.6/5.5 **M1** for 'their 1.2' –1 oe
	(ii)	1.875 cao	2	**M1** for 6.60/3.52, imp by 1.87 or 1.88
	(d) (i)	300, 50	1	
	(ii)	45000	1	**SC1** 43200
4	**(a)**	56 to 60	2	**B1** for 5.6 to 6.0
	(b)	[0]35 to [0]39	1	
	(c)	Correct length and bearing	2	**B1** for correct length 7.8 to 8.2 **B1** for correct bearing 302º to 306º

5	**(a) (i)**	Perpendicular bisector with 2 sets of correct arcs	2	**B1** correct line with some o
	(ii)	M labelled	1ft	Ft is intersection of their bisector wi DE
	(iii)	Angle bisector with 2 sets of correct arcs	2	**B1** correct line with some or no arcs
	(iv)	Trapezium	1	
	(b) (i)	Circle centre A radius 4 cm ± 0.2 cm	1	
	(ii)	Circle centre E radius 3 cm ± 0.2 cm	1	
	(iii)	Correct region shaded cao	1	
6	**(a)**	$AM^2 + 1.2^2 = 1.5^2$ or $[AM^2] = 1.5^2 - 1.2^2$	M1	
		[AM=] $\sqrt{(1.5^2 - 1.2^2)}$ or $\sqrt{(2.25 - 1.44)}$ or $\sqrt{0.81}$	M1dep	
	(b)	36.9 or 36.87 or 36.8[6.....]	2	**M1** for $\cos[ABM] = \frac{1.2}{1.5}$ oe or better
	(c)	2.7	1	
		m^3	1	indep
	(d)	14.2 or 14.16	3	**M2** for $2 \times 0.5 \times 2 \times 0.9 \times 1.2 + 2.5 \times 2 \times 0.9 + 2 \times 2.5 \times 1.5$ or better or **M1** for $2.5 \times 2 \times 0.9$ or $2 \times 2.5 \times 1.5$ or better if **M0 then SC1** for 13.41

7	**(a)**	8, 2, –2,	2	**B1** for 2 correct y values
	(b)	7 correctly plotted points	3ft	**P2ft** for 5 or 6 correctly plotted poi **P1ft** for 3 or 4 correctly plotted points
		Correct smooth curve going below $y = -4$ at lowest point	1	
	(c) (i)	(2.5cao , –4.25)	1	
	(ii)	$y = -1$ drawn	1	must be ruled and continuous
	(iii)	0.5 to 0.9, 4.1 to 4.5	1ft,1ft	ft is the x coordinates of the intersection of their line and their curve
	(d)	(– 5, 2)	1	
	(e)	$[y] = -2x + 3$	3	**M2** for $y = -2x + p$ or $y = 2x + 3$ **or M1** for $y = 2x + q$ or for attempt at rise/run even if negative not shown **B1** for $y = kx + 3$ $k \neq 0$
8	**(a)**	6	2	**M1** for $\frac{4}{40}$ [× 60] oe
	(b) (i)	Line from (1450,4) to (1510,4) Line from (1510,4) to (1530,0)	1 1ft	Ft is (their 1510,4) to (their 1510 + 20,0)
	(b) (ii)	1530	1ft	
	(c) (i)	4 points plotted correctly	2	**P1** for 3 correct
	(ii)	Positive	1	
	(iii)	Correct ruled line	1	
	(iv)	12< Ans <16	1ft	

9	**(a) (i)**	53.2[0]	3	**SC2** for 60.80 **M2** for 2 × (6 + 4 × 2) + 3 × (3.6 1.20) or better **or** for 2 × 6 + 3 × 3.60 + 4(2 × 2 + 3 × 1.20) or better **if M0 then B1** for 28 or 25.20 or 22.80 or 22.40 or 30.40 or 12 **and** 10.80 or 16 **and** 14.40 or 14 **and** 8.40 seen
	(ii)	45.22	2ft	**M1ft** for 'their ai' × 0.85 oe
	(b) (i)	201 or 201.06 to 201.1 or 2.01**m**	2	**M1** for $2 \times \pi \times 32$ oe
	(ii)	11 final answer	2	**M1ft** for $\frac{2400}{\textit{their bi}}$ both in cm or $\frac{24}{\textit{their bi}}$ both in m **or SC1** for figs '119……'
(c)		11.6	3	**M1** for $\frac{360}{9} \times 29$ or better, implied by 1160 **and M1 indep** for 'their 1160' / 100 soi or 0.29 seen
10	**(a) (i)**	12	2	**B1** for any other common factor other than 1
	(ii)	$12(2x + 3y)$ cao	1	
	(b) (i)	$10k - 4w$	2	**B1** for either $10k \pm nw$ or $qk - 4w$ $p,q \neq 0$
	(ii)	x^{20}	1	
	(c)	$4n + 3$ oe final answer	2	**B1** for $4n + c$ or $kn + 3$, $k \neq 0$
	(d)	$[x] = 2.5$, $[y] = 0.5$	3	**M1** for correct method to eliminate one variable. **A1** for x or y correct.