MARK SCHEME for the May/June 2013 series

0580 MATHEMATICS

0580/32   Paper 3 (Core), maximum raw mark 104

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 by 6.125 **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 or no arcs
		(ii)	M labelled	1ft	Ft is intersection of their bisector with 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 $\pm$ 0.2 cm	1	
		(ii)	Circle centre E radius 3 cm $\pm$ 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 $\cos[ABM] = \dfrac{1.2}{1.5}$ 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 points **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 $\dfrac{4}{40}$ [× 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 $2 \times (6 + 4 \times 2) + 3 \times (3.60 + 4 \times 1.20)$ or better **or** for $2 \times 6 + 3 \times 3.60 + 4(2 \times 2 + 3 \times 1.20)$ 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' $\times 0.85$ 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 $\dfrac{2400}{their\ bi}$ both in cm or $\dfrac{24}{their\ bi}$ both in m **or SC1** for figs '119……'
	(c)		11.6	3	**M1** for $\dfrac{360}{9} \times 29$ 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.