

**MARK SCHEME for the May/June 2011 question paper
for the guidance of teachers**

0580 MATHEMATICS

0580/33

Paper 3 (Core), maximum raw mark 104

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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.	Answers	Mark	Part Marks	
1	(a) 805	2	M1 for $110 \times 5 + 85 \times 3$	
	(b) 50	2	M1 for $750 - 120 \times 5$	
	(c)	(i) 90	2	M1 for $150 \div (3 + 2) \times 3$
		(ii) 5 : 2	3	M1 for 3×5 and 2×3 or $90\text{ft} \times 5$ and $(150 - 90\text{ft}) \times 3$ A1 for 450 : 180 oe or 2.5:1 or 1:0.4
	(d) 6.5(0)	2	M1 for 5×1.3 oe	
	(e) 10 www	3	M2 for $\frac{0.30}{3} \times 100$ oe (M1 for 0.30 or 30c) If M0 then SC1 for $\frac{0.3}{2.7} \times 100$ (implied by 11.1...%)	
2	(a) Accurate triangle <i>PQR</i> with arcs	2	SC1 for accurate without arcs or correct mirror image with arcs	
	(b)	(i) Accurate perpendicular bisector of <i>PR</i> with arcs	2ft	SC1 ft for accurate without arcs or accurate arcs without line or accurate with arcs of other side.
		(ii) Accurate angle bisector of angle <i>P</i> with arcs	2ft	SC1 ft for accurate without arcs or accurate arcs without line or accurate with arcs of other angle.
	(c) Region shaded cao	1	Intended region clear	
	(d) 4.5 cao	2	SC1 for figs 45 or 3.5 or 1 cm = 0.5 km	
3	(a) 50	1		
	(b) 72	2	M1 for $288 \times 90 \div 360$ oe	
	(c) 1	1		
	(d)	(i) 40, 96, 72 ft, 80	2ft	B1 for 2 or 3 correct or SC1 for total of 288
		(ii) 1.67	3ft	ft their table M1 for $(40 \times 0) + 96 \times 1 + 72 \times 2 + 80 \times 3$ M1 (dep) for \div total by 288

(e) (i)	$\frac{100}{360}$ oe (0.2777... or 27.77...%)	1ft	ft their table if used i.e. $\frac{their80}{their288}$
(ii)	$\frac{310}{360}$ oe (0.8611... or 86.11...%)	2ft	M1 for 120 + 90 + 100 or 96 + 72 + 80 ft their table if used i.e. $\frac{their248}{their288}$
(iii)	0	1	allow 0/360 or 0/288, zero, none, impossible
(f)	400	1ft	ft their table or their (e)(i) if either used must be an integer answer
4 (a)	1.12	2	M1 for 1.4×0.8
(b)	224	1ft	ft (a) $\times 200$
(c) (i)	39.3 (39.25 to 39.28)	2	M1 for $\pi \times 0.25^2 \times 200$
(ii)	185 (184.7 to 184.8)	1ft	ft their (b) – their (c)(i)
(iii)	4.9 cao www 3	3ft	M1 for (c)(i) $\div 8000$ A1 for 0.00491 (0.004906 to 0.004910) ft their (c)(i)
5 (a) (i)	-1.5, 2, 1.5	2	B1 for 2 correct
(ii)	12 correct points Correct curve in two branches through at least 10 points	P3ft C1	ft their table P2 for 10 or 11 points ft P1 for 8 or 9 points must be two branches of a rectangular hyperbola between the axes
(b) (i)	0, -1.5, -1.5, 0	2	B1 for 2 or 3 correct
(ii)	9 correct points Correct curve through at least 7 points	P3ft C1	ft their table P2 for 7 or 8 points ft P1 for 5 or 6 points must be close to parabola in shape
(c)	(2.7 to 2.99, 2.01 to 2.3) cao	1, 1	
6 (a)	70	2	M1 for 180–140 or 40 at A oe
(b)	108	2	M1 for 72 vertically opposite to given 72 or next to q or 108 next to 72 given
(c)	54	1	
(d)	68	1	
(e) (i)	Similar	1	Allow enlarged
(ii)	12.5	2	M1 for $\frac{XZ}{10} = \frac{10}{8}$ oe or better

7	(a) (i)	4	2	M1 for $2x + x = 15 - 3$ or better
	(ii)	11	2	M1 for $2y - 1 = 7 \times 3$ or $\frac{2y}{3} = 7 + \frac{1}{3}$ or better
	(iii)	1.5 oe	3	M1 for $2(u - 1) = 1$ A1 for $2u - 2 = 1$
	(b) (i)	$p = 2q + r$ or $p = r + 2q$ oe	1	
	(ii)	$k = (l + m)^2$	2	SC1 for $(l + m)^2$ or for $k = \sqrt{l + m}$
	(c)	2.9 cao www 4	4	M1 for $2w$ or $3(w - 1)$ M1 for $2w + 3(w - 1) = 11.5$ A1 for $2w + 3w = 11.5 + 3$ or better
8	(a) (i)	Image at (3, -1), (5, -1), (5, -2), (3, -3)	1	
	(ii)	Image at (6, 5), (8, 5), (8, 6), (6, 7)	2	SC1 for translation by $\begin{pmatrix} 3 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ 4 \end{pmatrix}$ or $\begin{pmatrix} -3 \\ -4 \end{pmatrix}$
	(iii)	Image at (-3, -1), (-5, -1), (-5, -2), (-3, -3)	2	SC1 for 180° rotation not about (0, 0)
	(b) (i)	Reflection, $x = -1$	1, 1	Allow clearly labelled line in place of $x = -1$
	(ii)	Enlargement, (factor) 3, (centre) (6, 1)	1, 1, 1	Allow centre clearly labelled
9	(a)	Diagram drawn	1	
	(b)	7, 9, 11	2	B1 for 2 correct
		21 $2n + 1$ oe	1 2	SC1 for $2n +$ or $-$ any integer
	(c)	368	2ft	Must be integer for 2 marks M1 for their $2n + 1 = 737$ ft if linear
(d)	20, 44, $4(n + 1)$ oe	1, 1 1		