

**MARK SCHEME for the October/November 2010 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
art	anything rounding to
soi	seen or implied

Qu.	Answers	Mark	Part Marks
<b>1</b>	<b>(a)</b> 10, 9, 5, 5, 1	3	<b>B2</b> for 4 correct, <b>B1</b> for 3 correct
	<b>(b)</b> <b>(i)</b> 2	1	
	<b>(ii)</b> 2.5	2	<b>M1</b> for evidence of finding mid-value of 20 pieces of data
	<b>(iii)</b> 2.6	3	<b>M1</b> for evidence of $\sum fx$ then <b>M1dep</b> for $\div 40$
	<b>(c)</b> <b>(i)</b> 81 or 45 45 or 81 <b>(ii)</b> Correct angles of $81^\circ$ and $45^\circ$	2ft 1ft 1ft	ft their 9 or their 5 <b>M1</b> for their 9 or their $5 \div 40 \times 360$ Correct or ft 126 – their first angle ft only if add up to 126
<b>2</b>	<b>(a)</b> <b>(i)</b> 18 30 oe <b>(ii)</b> 251 (250.9...)	1 3	<b>M1</b> for distance $\div$ time (any units) and <b>M1</b> for $55 \div 60$ oe
	<b>(b)</b> <b>(i)</b> 1400 <b>(ii)</b> 20.7(2...) <b>(iii)</b> 91	2 1 2	<b>M1</b> for $9121 \div 6.515$ <b>B1</b> for 90.89 or 90.9 or 90.8 or $610 \times 0.149$ or <b>B1</b> (indep) for correct rounding to integer if from a decimal
<b>3</b>	<b>(a)</b> <b>(i)</b> Translation $\begin{pmatrix} -5 \\ 3 \end{pmatrix}$	1, 1	
	<b>(ii)</b> Reflection in line $y = 4$	1, 1	Line can be labelled on diagram
	<b>(iii)</b> Rotation, (2, 2.5), $180^\circ$ or half-turn	1, 1, 1	Centre could be labelled on diagram
	<b>(b)</b> <b>(i)</b> Correct reflection in y-axis	2	<b>SC1</b> for reflection in x-axis
	<b>(ii)</b> Correct enlargement, (0, 0), factor 4	2	<b>SC1</b> for any enlargement centre (0, 0) or factor 4

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4	(a) (i) 214 (213.6...) (ii) 20.6 or (20.55 – 20.56)	2 2	<b>M1</b> for $75^2 + 200^2$ <b>M1</b> for $\tan = 75/200$ or $\sin = 75/\text{their (i)}$ or $\cos = 200/\text{their (i)}$
	(b) (i) (0)44 ((0)44.4...) (ii) 224 (224.4...) (iii) 335	1ft 1ft 2	<b>B1</b> 65 – their (a)(ii) if < 65 180 + their (b)(i) <b>B1</b> for 65 below <i>B</i> or 25 above <i>B</i> , may be on diagram
5	(a) (i) Accurate perpendicular bisector of <i>AB</i> with arcs	2	<b>SC1</b> if accurate without arcs or accurate bisector of wrong side with arcs
	(ii) Accurate bisector of angle <i>ADC</i>	2	<b>SC1</b> if accurate without arcs or accurate bisector of wrong angle with arcs
	(b) Ruled line 2 cm from and parallel to <i>BC</i>	2	<b>SC1</b> if not ruled
	(c) Correct region shaded cao	1	Dependent on at least <b>SC1</b> in (a)(i), (a)(ii) and (b)
6	(a) (i) 60 (ii) 1200	2 1ft	<b>M1</b> for full method for area with correct values ft their (i) $\times 20$
	(b) (i) 10.2	2ft	<b>SC1</b> for figs 102 or <b>M1</b> for (a)(ii) $\times 8.5 \div 1000$ ft their (a)(ii) $\times 8.5 \div 1000$ and SC in same way
	(ii) 23.05	2ft	ft their (b)(i) $\times 2.26$ <b>M1</b> for 23.052 or 23.1 or (b)(i) $\times 2.26$ or <b>B1ind</b> for correctly rounding to 2 dp an answer with more than 2 dp
7	(a) $2d - 9$	2	<b>SC1</b> for $9 - 2d$
	(b) 8.4(0)	2	<b>M1</b> for their (a) = 7.8(0)
	(c) 0.6(0)	1ft	ft their (b) – 7.80, <b>only</b> if positive
8	(a) 35.3 art	2	<b>M1</b> for substituting $r = 7.5$ in formula
	(b) $\sqrt{\frac{5A}{\pi}}$	3	<b>M1</b> for correctly multiplying by 5 <b>M1</b> for correctly dividing by $\pi$ <b>M1</b> for correctly taking a square root
	(c) 2.76 art cao	2	<b>M1</b> for substituting 4.8 in their (b) or if working backwards from original formula, substituting and reaching $r^2 = 5 \times 4.8 \div \pi$

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9	(a) (i) 8, 3	1, 1	<b>P1</b> for 4 correct points ft
	(ii) 5 points correctly plotted Smooth curve through their 5 points	2ft 1	
	(iii) $3.4 \leq x \leq 3.6$	1ft	
	(b) (i) 3, 2, 1.5	1, 1, 1	<b>B1</b> each <b>P1</b> for 6 or 7 points
	(ii) 8 points correctly plotted Smooth branch of rectangular hyperbola through 12 points	2ft 1	
	(c) $(1 < x \leq 1.2, 10.6 \leq y < 11)$ $(2.6 \leq x < 3, 4.2 \leq y \leq 4.5)$	1ft 1ft	
10	(a) $360 \div 8 (= 45)$ Then $180 - \text{their } 45 (= 135)$	1 1dep	Alt method $180 \times (8 - 2)$ Then their $1080 \div 8 (= 135)$
	(b) (i) 45	1	
	(ii) 90	1	
	(c) (i) 35.99 to 36.(0)	2	<b>M1</b> for $0.5 \times 8.485 \times 8.485$ <b>M1</b> for $(12 + 8.485 + 8.485)^2$ <b>M1ind</b> for correct collection of area with or without values indicated
	(ii) 695 to 696.4	3ft	
11	(a) (i) $5 + 8 (= 13)$	1	<b>B1</b> for $2n \pm k$ or $jn - 1$ ( $j \neq 0$ )
	(ii) 12, 19	1	
	10, 17	1	
	7, 9	1	
	3, 6	1	
	4, 5	1	
	3, 2	1	
	(b) (i) 11	1	
	$2n - 1$	2	
	(ii) $36 \quad n^2$	1, 1	
	(iii) $\frac{1}{6} \quad \frac{1}{n}$	1, 1	