

**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**  
International General Certificate of Secondary Education

**MARK SCHEME for the October/November 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) 1.64	B1	
	3.6(0)	B1	
	1.68	B1	
	(b) (i) 9.47 ft	1ft	ft their table
	(ii) 0.53 ft	1ft	ft their (i)
	(c) (i) 10 31	2	B1 for 43 seen
	(ii) 2 : 5 cao	2	B1 for 18 : 45 oe
(d) 34.9	1		
2	(a) (i) 11	1	
	(ii) 15	1	
	(iii) 14.5	2	M1 for ordering list or substantial part of list or 14 & 15
	(iv) 14	2	M1 for (9 + 11 + 11 + 12 + 13 + 14 + 15 + 15 + 15 + 15 + 18 + 20)
	(b) (i) 3, ..., 2	1	
	(ii) Angles of 90° and 60° Correct labels	1ft 1	ft only if total equals 12 (Dependent)
	(c) $\frac{5}{6}$ cao	2	M1 for $\frac{10}{12}$ or $\frac{\text{their } 3 + 7}{\text{their } 12}$ from table
3	(a) 5	1	
	(b) 150	2	B1 for 450 seen or implied
	(c) 1.8	3	M2 for $\frac{0.45}{0.25}$ oe (M1 for correct distance ÷ correct time)
	(d) Straight line (09 25, 600) to (10 00, 600)	1	
	Straight line (10 00, 600 to 10 10, 0) ft	2ft	M1 for 600 ÷ 60 oe ft their graph 10 mins to time axis

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4	(a) (i) Correct reflection	2	<b>B1</b> if reflected in other vertical line
	(ii) Correct rotation	2	<b>B1</b> if rotated about $C$ but clockwise through $90^\circ$ or correct rotation about their reflected $C$
	(b) (i) Translation, $\begin{pmatrix} -9 \\ -1 \end{pmatrix}$	2	<b>B1</b> for translation <b>B1</b> for column vector
	(ii) Enlargement, (centre) $(0, 0)$ , (sf) $\frac{1}{2}$	3	<b>B1 B1 B1</b>
5	(a) (i) 104	2	<b>M1</b> for $360 - (52 + 140 + 92)$ implied by 76
	(ii) Parallel Angle $YBX = 52^\circ$ oe	1	Dependent on (i) correct
	(b) 36	3	<b>M2</b> for $360 = 90 + 90 + x + 4x$ oe ( <b>B1</b> if angle $T$ or $U = 90^\circ$ soi)
	(c) 18	2	<b>M1</b> if angle sum = 360 soi or long method
6	(a) $-4, \dots, 4, \dots, 4, \dots, -4$	2	<b>B1</b> for both $-4s$ <b>B1</b> for both $4s$
	(b) 7 points plotted ft Reasonable curve through at least 6 points	3ft 1ft	<b>P2</b> for 5 or 6 points plotted ft <b>P1</b> for 3 or 4 Only ft if shape parabola
	(c) (i) The line $x = 1$ drawn	1ft	
	(ii) $x = 1$	1ft	
	(d) $-1.4$ to $-1.1$ , $3.1$ to $3.4$	2ft	<b>B1 B1ft</b> if not in these ranges
7	(a) $\dots, 5, 8, 7, 6, 4, 5, \dots$	2	<b>B1</b> for 4 or 5 correct
	(b) 40	1ft	
	(c) 4.5375 or 4.537 or 4.538 or 4.54 www3 Allow 4.5 but only with working	3	<b>M1</b> for $4 \times 3 + 5 \times 3.5 + 8 \times 4 + 7 \times 4.5 + 6 \times 5 + 4 \times 5.5 + 5 \times 6 + 1 \times 6.5$ <b>M1</b> dependent for dividing their 181.5 by their 40 ( <b>M1</b> + <b>M1</b> implied by 175(.1625))

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8	(a) Correct construction with arcs	2	<b>B1</b> for two correct lines without arcs or <b>B1</b> for accurate arcs seen or <b>B1</b> for 1 correct line with 2 arcs seen <b>SC1</b> for $AC = 8$ and $BC = 10$ correct with arcs
	(b) (i) Correct construction with arcs	2ft	ft their (a) <b>B1ft</b> for accurate line drawn without arcs or <b>B1ft</b> for accurate arcs seen or <b>B1ft</b> for accurate line with arcs bisecting another angle
	(ii) 4.2 to 4.5	1ft	<b>Strict</b> ft their <b>b(i)</b> with intersection on opposite side of triangle
	(c) (i) Correct construction with arcs	2ft	ft their (a) <b>B1ft</b> for accurate line drawn without arcs or <b>B1ft</b> for two pairs of accurate arcs seen or <b>B1ft</b> for accurate line with arcs, bisecting $AB$ or $AC$
	(ii) $129^\circ$ to $133^\circ$	1ft	<b>Strict</b> ft from their $C$ on triangle, their $Y$ on one side of triangle and their $Z$ on their intersection of <b>b(i)</b> and <b>c(i)</b>
	(d) Correct quadrilateral shaded	1	From their triangle
9	(a) (i) 750	3	<b>M2</b> for $0.5 \times 12 \times 5 \times 25$ seen or implied ( <b>M1</b> for $0.5 \times 12 \times 5$ or <b>M1</b> for their area of cross-section $\times 25$ )
	(ii) 0.72	2ft	ft their (i) $\times 0.00096$ <b>SC1</b> for 720 (or ft their (i) $\times 0.96$ )
	(b) (i) $5^2 + 12^2$ $\sqrt{169}$	<b>M1</b> <b>M1</b>	
	(ii) 64.8(0) www4	4	<b>M2</b> for $2 \times \frac{1}{2} \times 12 \times 5 + 25 \times 13 + 25 \times 12 + 25 \times 5$ ( <b>M1</b> for any three correct) <b>M1</b> for their area $\times 0.08$
10	(a) (i) 1200	1	
	(ii) $1200 + pw$	1ft	ft their (i) $+ pw$
	(iii) $\frac{1200 + pw}{15 + p}$	2ft	ft their (ii) $\div (15 + p)$ <b>M1</b> for $\div (15 + p)$
	(b) (i) 96	2	<b>M1</b> for $3(4)(5 + \frac{1}{2} \times 6)$ or better
	(ii) 7	3	<b>M1</b> for $84 = 3b(3 + \frac{1}{2} \times 2)$ or better <b>A1</b> for equation $12b = 84$ oe correct $kb = l$

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11	(a) 36, 48, 25, 24 ft	4	B1 each ft their 25 – 1
	(b) (i) $n^2$ oe	1	
	(ii) $n^2 - 1$ oe	1ft	ft their (i) – 1, if expression in $n$
	(c) (i) 25	1	
	(ii) 85	2	M1 for $7n - 3 = 592$ or better
(d) 8192, 2 097 152	2	B1 each SC1ft $256 \times$ their 8192	