**CAMBRIDGE INTERNATIONAL EXAMINATIONS Cambridge International General Certificate of Secondary Education** 

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# 0581 MATHEMATICS

0581/43

Paper 4 (Extended), maximum raw mark 130

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#### Mark Scheme Cambridge IGCSE – October/November 2014

#### Abbreviations

cao	correct answer only
dep	dependent
FT	follow through after error
isw	ignore subsequent working
oe	or equivalent
SC	Special Case
nfww	not from wrong working

seen or implied soi

	Qu.	Answers	Mark	Part Marks
1	(a) (i)	5.37[1]	2	<b>M1</b> for $[AD^2 = ] 2.6^2 + 4.7^2$ oe or better
	(ii)	54.1 or 54.11 to 54.12	3	<b>M2</b> for tan [ <i>BCD</i> =] $\frac{4.7}{(17 - 11 - 2.6)}$ oe
				or B1 for 3.4 seen
	(iii)	65.8	2	<b>M1</b> for $\frac{11+17}{2} \times 4.7$ oe
	<b>(b)</b>	263.2 or 263	3FT	<b>FT</b> <i>their</i> (a)(iii) $\times$ 4 correctly evaluated
				<b>M2</b> for <i>their</i> (a)(iii) $\times \left(\frac{9.4}{4.7}\right)^2$ oe
				or $(z, z)^2 = (z, z)^2$
				<b>M1</b> for [scale factor =] $\left(\frac{9.4}{4.7}\right)^2$ or $\left(\frac{4.7}{9.4}\right)^2$ soi
2	(a) (i)	$\frac{920}{8} \times 7$ [=805] oe	1	$\frac{2990}{26} \times 7 \ [= 805]$
	(ii)	30.8 or 30.76 to 30.77	2	<b>M1</b> for $\frac{8}{(11+8+7)}$ [× 100]
	(b)	1211 final answer	5	<b>B4</b> for 13926.5[0] [area A total sales]
				or B3 for 11 040 [area B] and 10 867.50 [area C] or 21 907.5 [area B + area C]
				or B2 for 11040 [area B] or 10867.50 [area C]
				or M1 for 736 [B tickets] and M1 for 483 [C tickets]
				After 0 scored
				SC2 for answer of 1196 or
				SC1 for 13754 (A total sales)

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L		Cambridge IGCSE – O	ctober/	Syl 7.7 per November 2014 058
	(c)	37720	3	November 2014Sy.perNovember 2014058M2 for $\frac{35834}{0.95}$ oe or M1 for 35834 associated with 95[%]
	(a) (i)	52 Angles in <b>same segment</b>	1 1dep	Accept same arc, same side of same chord
	(ii)	104 <b>Angle</b> at <b>centre</b> is <b>twice</b> angle at <b>circumference</b>	1 1	Accept double, $2 \times$ but not middle, edge
	(iii)	34 Angle between <b>tangent</b> and <b>radius</b> = 90°	1 1	Accept right angle, perpendicular
	(b) (i)	7.65 to 7.651	4	M2 for $8.92 + 72 - 2 \times 8.9 \times 7 \times \cos 56$ or M1 for correct implicit formula and A1 for 58.5 to 58.6
	(ii)	49.3 or 49.33 to 49.34	3	M2 for $[\sin BEC =] \frac{7 \sin 56}{their (\mathbf{b})(\mathbf{i})}$ oe or M1 for $\frac{\sin 56}{their (\mathbf{b})(\mathbf{i})} = \frac{\sin BEC}{7}$ oe
	(a) (i)	Ariven with comparable form for both shown or difference between the two fractions shown	1	Accept probabilities changed to decimals or percentages (to 2sf or better)
	(ii)	$\frac{6}{15}$ oe	2	<b>M1</b> for $\frac{3}{5} \times \frac{2}{3}$
	(iii)	$\frac{7}{15}$ oe	3	M2 for $\frac{3}{5} \times \frac{1}{3} + \frac{2}{5} \times \frac{2}{3}$ oe $1 - their$ (a)(ii) $-\frac{2}{5} \times \frac{1}{3}$ or M1 for $\frac{3}{5} \times \frac{1}{3}$ or $\frac{2}{5} \times \frac{2}{3}$ seen
	(b) (i)	Completes tree diagram correctly	3	<ul><li>B2 for 5 values correct</li><li>or</li><li>B1 for 1 value correct</li></ul>
	<b>(ii)</b>	$\frac{126}{350}$ oe $\left[\frac{9}{25}\right]$	2	<b>M1</b> for $\frac{3}{5} \times \frac{6}{7} \times \frac{7}{10}$

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	V		Mark Scheme         Syl         per           Cambridge IGCSE – October/November 2014         058         058		
	(iii)	$\frac{344}{350}$ oe	3	Sy.         oer           November 2014         058           M2 for $1-their \frac{2}{5} \times their \frac{1}{7} \times their \frac{3}{10}$ oe         or           or $\frac{3}{5} + \frac{2}{5} \times \frac{6}{7} + \frac{2}{5} \times \frac{1}{7} \times \frac{7}{10}$ oe           M1 for their $\frac{2}{5} \times their \frac{1}{7} \times their \frac{3}{10}$ oe         oe           or identifies the 7 routes         or           or attempt to add 7 probabilities with at least 5 correct $\frac{9}{25} + \frac{27}{175} + \frac{3}{50} + \frac{9}{350} + \frac{6}{25} + \frac{18}{175} + \frac{1}{25}$ oe	
5	(a) (i)	$\begin{pmatrix} 0 & -4 \\ 4 & 0 \end{pmatrix}$	1		
	(ii)	$\begin{pmatrix} -1 & 1 \\ 1 & -1 \end{pmatrix}$	1		
	(iii)	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	2	B1 for three correct elements	
	(iv)	$\begin{pmatrix} -13\\5 \end{pmatrix}$	2	<b>B1</b> for either correct in this form	
	(b)	$\begin{pmatrix} 0 & -4 \\ 4 & 0 \end{pmatrix}$ $\begin{pmatrix} -1 & 1 \\ 1 & -1 \end{pmatrix}$ $\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$ $\begin{pmatrix} -13 \\ 5 \end{pmatrix}$ $\begin{pmatrix} 1 & 2 \\ 0 & 1 \end{pmatrix}$	3	M1 for understanding to find the inverse of <b>Q</b> and M1 for det = 1 or for $k \begin{pmatrix} 1 & 2 \\ 0 & 1 \end{pmatrix} k \neq 0$ Alternative $\begin{pmatrix} 1 & -2 \\ 0 & 1 \end{pmatrix} \begin{pmatrix} a & b \\ c & d \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ Leading to $a - 2c = 1$ and $c = 0$ then $a = 1$ and $b - 2d = 1$ and $d = 1$ then $b = 2$ M2 all four equations, M1 for a pair of correct equations	
6	(a) (i)	$\frac{x^8}{3}$ final answer	1		
	(ii)	$15x^7y^3$ final answer	2	M1 for 2 elements correct	
	(iii)	$16x^8$ final answer	2	<b>M1</b> for $16x^k$ or $kx^8$	

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(b) $\sqrt{\left[(- 7 )^2 - 4.3 - 12 \text{ or better} }$ and $p = [ 7  \text{ and } r = 2(3) \text{ oe}$ B1 $\operatorname{Must see} \frac{p + \sqrt{q}}{r} \text{ or } \frac{p - \sqrt{q}}{r} \text{ or both} $ or for $\frac{7}{6} \pm \sqrt{4 + \left(\frac{7}{6}\right)^2}$ B1 $\operatorname{Must see} \frac{p + \sqrt{q}}{r} \text{ or both} $ or for $\frac{7}{6} \pm \sqrt{4 + \left(\frac{7}{6}\right)^2}$ (c) $\frac{x + 5}{x^2} \text{ or } \frac{1}{x} + \frac{5}{x^2}$ final answer 3 B1B1 $\operatorname{After B0},$ SC1 for answer 3.5 and -1.1 or 3.482 and -1.149 to -1.148 seen or for 3.48, -1.15 seen or for 3.48, -1.15 seen or for 3.48, -1.15 seen or for answer -3.48 and 1.15 (c) $\frac{x + 5}{x^2}$ or $\frac{1}{x} + \frac{5}{x^2}$ final answer 3 B1 for $(x + 5)(x - 5)$ and B1 for $(x^2 \times 5)$ 7 (a) $\frac{1}{2} \times 8 \times 8 \times \sin 56$ oe 26.53 A1 $\frac{1}{3.75}$ 7 (a) $\frac{1}{2} \times 8 \times 8 \times \sin 56$ oe 26.53 A1 $\frac{1}{3.75}$ 7 (b) (i) 72.[0] or 71.87 to 72.0 3 M2 for $26.5/(\pi \times 6.5^2) \times 360$ oe or M1 for $\frac{x}{360} \times \pi \times 2 \times 6.5 + 2 \times 6.5$ oc or M1 for $\frac{x}{360} \times \pi \times 2 \times 6.5 + 2 \times 6.5$ oc or M1 for $\frac{1}{360} \times \pi \times 2 \times 6.5 + 2 \times 6.5$ oc or M1 for $\frac{1}{12} \times \pi \times x^2 - \frac{1}{4} \times r^2$ (c) (i) $\frac{30}{360} \times \pi \times x^2 - \frac{1}{4} \times r^2$ A1 $\frac{1}{4}r^2(\frac{1}{3}\pi - 1)$ A1 $\frac{1}{3}$ P2 for $[h^2r(\mathbf{P})(\mathbf{P})(\mathbf{P}) \times \pi \times 2 \times 6.5 + 2 \times 6.5$ oc or M1 for $\frac{3}{360} \times \pi \times r^2$ or $\frac{1}{2} \times r^2 \times \sin 30$ A1 $\frac{1}{12} \times \pi \times r^2 - \frac{1}{4} \times r^2$ A1 Dep on M2 A1 and no errors seen (ii) 20.6 or 20.7 or 20.55 to 20.71 3 M2 for $[r^2 = 1] \frac{5}{\frac{1}{\sqrt{4}(\frac{1}{\sqrt{3}}\pi - 1)}}$ or M1 for $\frac{1}{4}r^2(\frac{1}{3}\pi - 1) = 5$				1	2
and the set of t		(b)			or for $\left(x - \frac{7}{6}\right)^2$
and the set of t			p = []7 and $r = 2(3)$ oe	B1	Must see $\frac{r}{r}$ or $\frac{r}{r}$ or both
3.48, -1.15 caoSC1 for answer 3.5 and -1.1 or 3.482 and -1.140 to -1.148 seen or for 3.48, -1.15 seen or for 3.48, -1.15 seen or for 3.48, -1.15 seen or for 3.48, -1.15 seen or for answer -3.48 and 1.15(c) $\frac{x+5}{x^2}$ or $\frac{1}{x} + \frac{5}{x^2}$ final answer nfww3B1 for $(x + 5)(x - 5)$ and B1 for $x^2(x - 5)$ 7(a) $\frac{1}{2} \times 8 \times 8 \times \sin 56$ oe 26.52 to 26.53M1 A1or $[\frac{1}{2} \times 2]$ 8sin28 × 8cos28 or $[\frac{1}{2} \times 2] \times 7.06 \times$ 3.757(a) $\frac{1}{2} \times 8 \times 8 \times \sin 56$ oe 26.52 to 26.53M1 A1or $[\frac{1}{2} \times 2]$ 8sin28 × 8cos28 or $[\frac{1}{2} \times 2] \times 7.06 \times$ 3.757(a) $\frac{1}{2} \times 8 \times 8 \times \sin 56$ oe 					or for $\frac{7}{6} \pm \sqrt{4 + \left(\frac{7}{6}\right)^2}$
(c) $\frac{x+5}{x^2}$ or $\frac{1}{x} + \frac{5}{x^2}$ final answer nfww3 <b>B1</b> for $(x+5)(x-5)$ and <b>B1</b> for $x^2(x-5)$ 7(a) $\frac{1}{2} \times 8 \times 8 \times \sin 56$ oe $26.52$ to $26.53$ M1 A1or $[\frac{1}{2} \times 2]$ $8 \sin 28 \times 8 \cos 28$ or $[\frac{1}{2} \times 2] \times 7.06 \times$ $3.75$ (b)(i)72.[0] or 71.87 to 72.03M2 for $26.5/(\pi \times 6.5^2) \times 360$ oe or M1 for $\frac{x}{360} \times \pi \times 6.5^2 = 26.5$ or better(ii)21.1 or 21.2 or 21.14 to 21.173M2 for $\frac{their (\mathbf{b})(\mathbf{i})}{360} \times \pi \times 2 \times 6.5 + 2 \times 6.5$ oe or M1 for $\frac{their (\mathbf{b})(\mathbf{i})}{360} \times \pi \times 2 \times 6.5$ oe or $\frac{their (\mathbf{a})}{0.5 \times 6.5}$ (c)(i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ oe $\frac{1}{12} \times \pi \times r^2 - \frac{1}{4} \times r^2$ $\frac{1}{4} r^2 (\frac{1}{3} \pi - 1)$ M2(ii)20.6 or 20.7 or 20.55 to 20.713M2 for $[r^2=]$ (iii)20.6 or 20.7 or 20.55 to 20.713			3.48, -1.15 cao	B1B1	SC1 for answer 3.5 and -1.1 or 3.482 and -1.149 to -1.148 seen
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7       (a) $\frac{1}{2} \times 8 \times 8 \times \sin 56$ oe $26.52$ to $26.53$ M1 A1       or $[\frac{1}{2} \times 2] 8\sin 28 \times 8\cos 28$ or $[\frac{1}{2} \times 2] \times 7.06 \times 3.75$ (b)       (i)       72.[0] or 71.87 to 72.0       3       M2 for $26.5/(\pi \times 6.5^2) \times 360$ oe or M1 for $\frac{x}{360} \times \pi \times 6.5^2 = 26.5$ or better         (ii)       21.1 or 21.2 or 21.14 to 21.17       3       M2 for $\frac{their(\mathbf{b})(\mathbf{i})}{360} \times \pi \times 2 \times 6.5 + 2 \times 6.5$ oe or M1 for $\frac{their(\mathbf{b})(\mathbf{i})}{360} \times \pi \times 2 \times 6.5$ oe or $\frac{their(\mathbf{a})}{0.5 \times 6.5}$ (c)       (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ oe $\frac{1}{12} \times \pi \times r^2 - \frac{1}{4} \times r^2$ M2       M1 for $\frac{30}{360} \times \pi \times r^2$ or $\frac{1}{2} \times r^2 \times \sin 30$ (ii)       20.6 or 20.7 or 20.55 to 20.71       A1       Dep on M2 A1 and no errors seen         (ii)       20.6 or 20.7 or 20.55 to 20.71       3       M2 for $[r^2 = ] \frac{5}{\frac{1}{\sqrt{4}(\frac{1}{\sqrt{3}}\pi - 1)}}$ M1 for one correct rearrangement step to $r$		(c)		3	and
(b) (i) 72.[0] or 71.87 to 72.0 (ii) 21.1 or 21.2 or 21.14 to 21.17 (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ oe $\frac{1}{12} \times \pi \times r^2 - \frac{1}{4} \times r^2$ (ii) 20.6 or 20.7 or 20.55 to 20.71 (b) $\frac{3}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (ii) $\frac{30}{12} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (ii) $\frac{30}{12} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (c) (c) $\frac{30}{12} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (c) (c) $\frac{30}{12} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (c) (c) $\frac{30}{12} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (c) (c) $\frac{30}{12} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (c) (c) $\frac{30}{12} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (c) (c) $\frac{30}{12} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (c) (c) (c) (c) (c) (c) (c) (c) (c)					<b>BI</b> for $x(x-5)$
(b) (i) 72.[0] or 71.87 to 72.0 (ii) 21.1 or 21.2 or 21.14 to 21.17 (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ oe $\frac{1}{12} \times \pi \times r^2 - \frac{1}{4} \times r^2$ (ii) 20.6 or 20.7 or 20.55 to 20.71 (b) $\frac{3}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (ii) $\frac{30}{12} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (ii) $\frac{30}{12} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (c) (c) $\frac{30}{12} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (c) (c) $\frac{30}{12} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (c) (c) $\frac{30}{12} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (c) (c) $\frac{30}{12} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (c) (c) $\frac{30}{12} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (c) (c) $\frac{30}{12} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ or (c) (c) (c) (c) (c) (c) (c) (c) (c) (c)	7	(a)	$\frac{1}{2} \times 8 \times 8 \times \sin 56$ oe	M1	or $[\frac{1}{2} \times 2]$ 8sin28 × 8cos28 or $[\frac{1}{2} \times 2] \times 7.06 \times$
(b) (i) 72.[0] or 71.87 to 72.0 3 M2 for $26.5/(\pi \times 6.5^2) \times 360$ oe or M1 for $\frac{x}{360} \times \pi \times 6.5^2 = 26.5$ or better (ii) 21.1 or 21.2 or 21.14 to 21.17 3 M2 for $\frac{their(\mathbf{b})(\mathbf{i})}{360} \times \pi \times 2 \times 6.5 + 2 \times 6.5$ oe or M1 for $\frac{their(\mathbf{b})(\mathbf{i})}{360} \times \pi \times 2 \times 6.5$ oe or $\frac{their(\mathbf{a})}{0.5 \times 6.5}$ (c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ oe $\frac{1}{12} \times \pi \times r^2 - \frac{1}{4} \times r^2$ $\frac{1}{4} r^2 (\frac{1}{3} \pi - 1)$ (ii) 20.6 or 20.7 or 20.55 to 20.71 3 M2 for $[r^2 = ] \frac{5}{\frac{1}{4} (\frac{1}{3} \pi - 1)}$ or M1 for one correct rearrangement step to r			2	A1	3.75
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(c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ oe $\frac{1}{12} \times \pi \times r^2 - \frac{1}{4} \times r^2$ $\frac{1}{4} r^2 (\frac{1}{3} \pi - 1)$ (ii) 20.6 or 20.7 or 20.55 to 20.71 M2 or M1 for $\frac{1}{360} \times \pi \times r^2$ or $\frac{1}{2} \times r^2 \times \sin 30$ M1 for $\frac{30}{360} \times \pi \times r^2$ or $\frac{1}{2} \times r^2 \times \sin 30$ A1 A1 Dep on M2 A1 and no errors seen M2 for $[r^2 = ] \frac{5}{\frac{1}{4} (\frac{1}{3} \pi - 1)}$ or M1 for one correct rearrangement step to r					or M1 for $\frac{x}{360} \times \pi \times 6.5^2 = 26.5$ or better
(c) (i) $\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30$ oe $\frac{1}{12} \times \pi \times r^2 - \frac{1}{4} \times r^2$ $\frac{1}{4} r^2 (\frac{1}{3} \pi - 1)$ (ii) 20.6 or 20.7 or 20.55 to 20.71 M2 or M1 for $\frac{1}{360} \times \pi \times r^2$ or $\frac{1}{2} \times r^2 \times \sin 30$ M1 for $\frac{30}{360} \times \pi \times r^2$ or $\frac{1}{2} \times r^2 \times \sin 30$ A1 A1 Dep on M2 A1 and no errors seen M2 for $[r^2 = ] \frac{5}{\frac{1}{4} (\frac{1}{3} \pi - 1)}$ or M1 for one correct rearrangement step to r		(ii)	21.1 or 21.2 or 21.14 to 21.17	3	M2 for $\frac{their(\mathbf{b})(\mathbf{i})}{200} \times \pi \times 2 \times 6.5 + 2 \times 6.5$ oe
(ii) $\begin{vmatrix} \frac{1}{12} \times \pi \times r^2 - \frac{1}{4} \times r^2 \\ \frac{1}{4}r^2 \left(\frac{1}{3}\pi - 1\right) \\ 20.6 \text{ or } 20.7 \text{ or } 20.55 \text{ to } 20.71 \\ 3 \\ 1 \\ 3 \\ 3 \\ 3 \\ 3 \\ 3 \\ 3 \\ 3 \\ $					200
(ii) $\frac{1}{4}r^{2}\left(\frac{1}{3}\pi-1\right)$ A1 Dep on M2 A1 and no errors seen 3 M2 for $[r^{2}=]\frac{5}{\frac{1}{4}\left(\frac{1}{3}\pi-1\right)}$ or M1 for one correct rearrangement step to r		(c) (i)	$\frac{30}{360} \times \pi \times r^2 - \frac{1}{2} \times r^2 \times \sin 30 \text{ oe}$	M2	M1 for $\frac{30}{360} \times \pi \times r^2$ or $\frac{1}{2} \times r^2 \times \sin 30$
(ii) $\frac{1}{4}r^{2}\left(\frac{1}{3}\pi-1\right)$ A1 Dep on M2 A1 and no errors seen 3 M2 for $[r^{2}=]\frac{5}{\frac{1}{4}\left(\frac{1}{3}\pi-1\right)}$ or M1 for one correct rearrangement step to r			$\frac{1}{12} \times \pi \times r^2 - \frac{1}{4} \times r^2$	A1	
or M1 for one correct rearrangement step to $r$				A1	Dep on M2 A1 and no errors seen
		(ii)	20.6 or 20.7 or 20.55 to 20.71	3	<b>M2</b> for $[r^2 =] \frac{5}{\frac{1}{4}(\frac{1}{3}\pi - 1)}$
from $\frac{1}{4}r^2\left(\frac{1}{3}\pi - 1\right) = 5$					
					from $\frac{1}{4}r^2\left(\frac{1}{3}\pi - 1\right) = 5$

# Mark Scheme Cambridge IGCSE – October/November 2014

Page 6     Mark Scheme     Syl				Syl Syl per
		Cambridge IGCSE -	- October/	Syn 7.0 per November 2014 058 Parts
8	(a) (i)	(1, 2)	1+1	ambrid
	(ii)	y = 3x - 1 cao final answer	3	Sy.oerNovember 2014058M1 for gradient = $\frac{84}{31}$ oeand M1 for substituting (3, 8) or (-1, -4) into <i>their</i> $y = 3x + c$ or for finding y-intercept is -1
	(b) (i)	(x+5)(x-2) isw solutions	2	<b>SC1</b> for $(x + a)(x + b)$ where $ab = -10$ or $a + b = 3$
	(ii)	$\begin{bmatrix} a = ] & -5 \\ [b = ] & 2 \\ [c = ] & -10 \end{bmatrix}$	3FT	<b>B1FT</b> for each of <i>their</i> 5 and <i>their</i> $-2$ from (b)(i) and <b>B1</b> for $c = -10$
	(iii)	x = -1.5	1FT	<b>FT</b> $x = (their (a + b))/2$
	(c)	Inverted parabola	<b>B</b> 1	
		x-axis intercepts at $-2$ and 9	B2	<b>B1</b> for each After <b>B0</b> allow <b>SC1</b> for $(0, -y)(2 + y)$ as
		<i>y</i> -axis intercept at 18	B1	After <b>B0</b> allow <b>SC1</b> for $(9 - x)(2 + x)$ oe
	(d) (i)	p = 6 q = 43	3	<b>B2</b> for $(x + 6)^2 - 43$ or $p = 6$ or $q = 43$ or <b>M1</b> for $(x + 6)^2$ or $x^2 + px + px + p^2$ and
				M1 for $-7 - (their 6)^2$ or $p^2 - q = -7$ or $2p = 12$
	(ii)	-43	1FT	$\mathbf{FT}$ – their q
9	(a) (i)	7	4	M2 for $\frac{16 \times 11 + 17 \times 10 + 18p + 19 \times 4 + 20 \times 8}{11 + 10 + 4 + 8 + p} = 17.7$ or better or M1 for sum of two correct products or better or for [total =] 11 + 10 + 4 + 8 + p and B1 for 582 + 18p = 17.7 (33 + p)
	(ii)	17	1FT	<b>STRICT FT</b> median for <i>their p</i> if integer
	(b) (i)	64	2	<b>M1</b> for $\frac{320}{6.4} \times 1.28$ oe
	(ii)	40	2	<b>M1</b> for $\frac{320}{480} \times 60$ oe
	(iii)	1.6[0]	2FT	FT <i>their</i> ( <b>b</b> )( <b>i</b> ) / <i>their</i> ( <b>b</b> )( <b>ii</b> ) evaluated correctly to 2dp
				<b>M1</b> for <i>their</i> ( <b>b</b> )( <b>i</b> ) / <i>their</i> ( <b>b</b> )( <b>ii</b> ) or $\frac{480}{6.4} \times 1.28 \div 60$

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Page 7	Mark Scheme Sy. Sy. oer		
	Cambridge IGCSE – Oct		Syl Parager November 2014 058 700
(c)	9.9125 cao	5	Sy.     oer       November 2014     058       B4 for answer 9912.5     07       M1 for 25 to 35 × 290 to 310 oe     058       and B1 for 32.5 used and B1 for 305 or 5 mins 5 secs     058       used     058       and M1 indep for any correct conversion seen m to km
10 (a) (i)	5x + 14 final answer	2	<b>M1</b> for $5x + k$ or $kx + 14$
(ii)	14.2	3	<b>M1</b> for $5x = 32 - 14$ <b>FT</b> <i>their</i> expression in (a)(i) <b>A1FT</b> for $x = 3.6$
(b)	8a - 3b + 14 = 32.5 or better 5a + 4b + 13.5 = 39.75 or better	B1 B1	8a - 3b = 18.5 5a + 4b = 26.25
	Equates coefficients of either <i>a</i> or <i>b</i> 40a - 15b = 92.5 40a + 32b = 210 or 32a - 12b = 74 15a + 12b = 78.75	M1	or rearranges one of <i>their</i> equations to make <i>a</i> or <i>b</i> the subject e.g. $a = \frac{3b + 18.5}{8}$
	Adds or subtracts to eliminate 47b = 117.5 47a = 152.75	M1	<b>Dep</b> on previous method or correctly substitutes into the second equation e.g. $\frac{5(3b+18.5)}{8} + 4b = 26.25$
	[ <i>a</i> =] 3.25	A1	0
	[ <i>b</i> =] 2.5	A1	After M0 scored SC1 for 2 correct values with no working or for two values that satisfy one of their original equations