

1	18.5 or 18.49 to 18.50...	5	<p>B2 for $\angle HOG = 112^\circ$ soi or B1FT for $\angle OHG = 34^\circ$ soi or $\angle HOG = 180 - 2 \times \text{their } \angle OHG$</p> <p>M1 for $\frac{\text{their}112}{360} \times \pi \times 6^2$ oe</p> <p>M1 for $\frac{1}{2} \times 6^2 \times \sin(\text{their}112)$ oe</p>
2	7π final answer	2	<p>M1 for $\frac{360-80}{360} \times \pi \times 3^2$ oe</p> <p>If 0 scored, SC1 for answer 2π</p>
3(i)	17.2 or 17.15 to 17.16	2	<p>M1 for $\tan\left(\frac{130}{2}\right) = \frac{PR}{8}$ oe</p>
3(ii)	47 to 47.4	4	<p>M1 for $[2 \times] \frac{1}{2} \times \text{their}17.2 \times 8$ or $[2 \times] \frac{1}{2} \times 8 \times \frac{8}{\cos 65} \times \sin 65$ or $\frac{1}{2} \times 8^2 \sin 130 + \frac{1}{2} \text{their}17.2^2 \sin 50$ oe</p> <p>AND</p> <p>M2 for $\frac{\text{their}137 - \frac{130}{360} \times \pi \times 8^2}{\text{their}137} [\times 100]$ oe or $\frac{\frac{130}{360} \times \pi \times 8^2}{\text{their}137} \times 100$ oe or M1 for $\frac{130}{360} \times \pi \times 8^2$ oe</p>

4

24

4

M1 for $\frac{60}{360} \times \pi \times 3^2$ oe

AND

M2 for $\frac{300}{360} \times \pi \times (6^2 - 3^2)$ oe

or $\pi \times 6^2 - \pi \times 3^2 - \frac{60}{360} \times \pi \times (6^2 - 3^2)$ oe

or **M1** for $\frac{300}{360} \times \pi \times 6^2$ oe or $\frac{300}{360} \times \pi \times 3^2$ oe

or $\pi \times 6^2$ oe or $\pi \times 3^2$ oe

5(a)	13.8 or 13.78 to 13.79	2	M1 for $\frac{1}{2} \times 6 \times 6 \times \sin 130$ oe After 0, SC1 for answer 55.2 or 55.15 to 55.16
5(b)	15.7 or 15.70 to 15.71	2	M1 for $\frac{180-130}{360} \times \pi \times 6^2$ oe After 0, SC1 for answer 62.8 or 62.83 to 62.84
6(a)(i)	25.7 or 25.72 to 25.73	2	M1 for $\frac{134}{360} \times 2 \times \pi \times 11$ oe
6(a)(ii)	4.3[0] or 4.298...	2	M1 for $\cos\left(\frac{134}{2}\right) = \frac{d}{11}$ or $\sin\left(\frac{180-134}{2}\right) = \frac{d}{11}$ oe
7(a)	7.54	2	M1 for $\pi \times 0.4^2 \times 15$
7(b)	53.7	4	M1 for $\frac{1}{2} \times 4.5^2 \times \sin 110$ oe M1 for $\frac{250}{360} \times \pi \times 4.5^2$ or $\frac{110}{360} \times \pi \times 4.5^2$ M1 for <i>their</i> 9.514 + <i>their</i> 44.18 oe
8(a)	32.56 to 32.58 or 32.6	3	M2 for $\frac{72}{360} \times \pi \times 20 + 20$ oe or M1 for $\frac{72}{360} \times \pi \times 20$ A1 for 12.56 to 12.58 or 12.6 After 0 or 1, SC1 for <i>their</i> 'arc length' + 10 + 10 soi
8(b)(i)	62.83 to 62.84 or 62.8	2	M1 for $\frac{72}{360} \times \pi \times 10^2$
8(b)(ii)	4(.00) to 4.08 nfww	3	FT from <i>their</i> (b)(i) – (58.76 to 58.8) provided answer not negative M2 for <i>their</i> (b)(i) – $2 \times \frac{1}{2} \times 10 \times 10 \times \sin\left(\frac{72}{2}\right)$ oe or M1 for [2×] $\frac{1}{2} \times 10 \times 10 \times \sin\left(\frac{72}{2}\right)$ oe soi

<p>9 (a) (i)</p> <p>(ii)</p> <p>(iii)</p>	<p>Dependent on 4 fig. term calculated using any version of π.</p> <p>239</p> <p>20.7</p>	<p>3</p> <p>2</p> <p>2</p>	<p>M1 for arc length $\frac{48}{360} \times 2\pi R$ oe and</p> <p>M1 for $R = 20 \times \frac{360}{48} \times \frac{1}{2\pi}$ oe</p> <p>M1 for $\frac{48}{360} \times \pi R^2$</p> <p>M1 for $2\pi r = \frac{312}{360} \times 2\pi R$ oe</p>
<p>10 a)</p> <p>(b)</p>	<p>320</p> <p>$6r + \frac{16\pi r}{3}$ final answer</p>	<p>3*</p> <p>2*</p>	<p>M2 for $\frac{a}{360} \times \pi \times (3r)^2 = 8\pi r^2$ oe OR M1 for $\frac{a}{360} \times \pi \times (3r)^2$ oe seen or for $8\pi r^2$ seen</p> <p>C1 for $kr + \frac{16\pi r}{3}$, where $k \geq 0$ OR M1 FT for $\frac{their320}{360} \times 2\pi \times 3r$ oe or for $6r + \frac{their320}{360} \times n\pi r$ oe where n is a positive integer</p>
<p>11a) (i)</p>	<p>2.62</p>	<p>2</p>	<p>M1 for $\frac{25}{360} \times 2\pi \times 6$</p>
<p>(ii)</p>	<p>7.85</p>	<p>2</p>	<p>M1 for $\frac{25}{360} \times \pi \times 6^2$</p>
<p>(b) (i)</p>	<p>39.3</p>	<p>1ft</p>	
<p>(ii)</p>	<p>88.8</p>	<p>3ft</p>	<p>B1 for 30 or 60 or M1 for $5 \times (a)(i)$ and indep M1 for $2 \times (a)(ii)$</p>
<p>12i)</p>	<p>$4(\pi)$ cao</p>	<p>2</p>	<p>B1 for $\pi \times 6^2$ or for $\frac{40}{360}$</p>
<p>(ii)</p>	<p>$12 + \frac{4}{3}\pi$ final answer</p>	<p>2</p>	<p>B1 for $(a =) 12$, or for $(b =) \frac{4}{3}$</p>
<p>(iii)</p>	<p>8</p>	<p>1ft</p>	

13(a)	10	1	
(b)	216	2	M1 for $\pi \times 6 \times 10 = \frac{x}{360} \times \pi r^2$ or $2 \times \pi \times 6 = \frac{x}{360} \times 2\pi r$ where $r = 10$ or <i>their(a)</i> . Where radians are used, method must include multiplication by $\frac{180}{\pi}$.

14i) 6.126 to 6.13

2 **M1** for $\frac{1}{2} \times 4 \times 4 \times \sin 130$

Or $\frac{1}{2} PQ \times$ perpendicular height (numerical)

(ii)	38.2 to 38.3	3	M1 for $\frac{(360-130)}{360} \times \pi \times 4^2$ soi by 32.11 or $\frac{130}{360} \times \pi \times 4^2$ soi by 18.15 And M1 for ' <i>their</i> major sector area' + ' <i>their</i> triangle area' Or for ' <i>their</i> circle area' - ' <i>their</i> minor sector area' + ' <i>their</i> triangle area'
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15 **(a)** 44.5

3 **M1** for numerical $\frac{\theta}{360} \times 2\pi \times 6$ oe

and

M1 for *their* arc + 12

If second **M** not scored, **A1** for 32.46 or 5.24 soi.

SC1 after 0 for $2\pi 6$ seen (= 37.7)

(b) 97.4

2 **M1** for numerical $\frac{\theta}{360} \times \pi \times 6^2$

SC1 after 0 for $\pi 6^2$ (= 113) seen

16	(a) 220	3	M1 for $\frac{150}{360} \times 2\pi r$ and B1 for their arc <i>AD</i> + their arc <i>BC</i> + 50
	(b) 2130	3	M2 for $\frac{150}{360} \pi (45^2 - 20^2)$ or M1 for $\frac{150}{360} \pi r^2$
	(c) 8.33	2	M1 for $2\pi r =$ <i>their</i> arc <i>AD</i> from (a) soi

Mega Lecture

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