Question			Answer	Marks	Part Marks and Guidance	
1			Perpendicular bisector of AB attempted	M1	**M0** for arcs/circles centres A and B with no line	Allow **M1** for line through midpoint of AB but at 80 to 100° to AB
			Accurately drawn bisector with correct compass arcs	A1	Line must extend at least between the circles below AB on the overlay	
			Circle centre C rad 5 cm	M1	Or arc of this circle extending through at least 3 of the seven circles for this arc on the overlay Condone arc hand drawn only if in tolerance for three consecutive circles on overlay	Tolerances 2 mm; if in doubt, use ruler Common
			Section of bisector inside circle clearly indicated	B1	FT *their* circle and line	

2			$\dfrac{106}{360} \times \pi \times 8^2$	M2	**M1** for $\dfrac{106}{360}$ oe or 360 ÷ 106 seen	
			½ × 8² × sin106	M1	Or 2 × $\dfrac{(8\sin 53 \times 8\cos 53)}{2}$ oe	
			59 to 60 or $\dfrac{848}{45}\pi$ oe or 30 to 31	A1		
			28.4 to 28.5 inclusive	A1		

3	(a)		150 + ½ × 80 oe	1	May be in words but must mention 150 and 40 (or ½ of 80)	Nothing incorrect
3	(b)*		Answer 1160 with commentary	7	eg Vertical strips – 5 × 150 = 750) Horizontal strips – 2 × 80 = 160) 1030 Radii – 3 × 40 = 120) Semi-circle – ½ × π × 80 = 125.6 to 126 Total = 1155.6 to 1156 ---	
			Answer 1160 but no commentary OR 1155.6 to 1156 seen with commentary	6-5	1155.6 to 1156 seen but with no commentary **OR** Correct method soi for straight total AND semi-circle length with commentary	
			Correct method soi for straight total AND semi-circle length but with no commentary	4-3	Correct method soi for semi-circle length AND horizontal total or vertical total or radii total **OR** Correct method for straight total AND π×80 (251 to 252) soi	
			Correct method soi for straight total OR semi-circle length	2-1	Correct method soi for horizontal total OR vertical total OR radii total OR π×80 soi	
			No relevant work	0		

4	(a)		106.225…rot to at least 1dp	3	*Mark best attempt* **M2** for $\dfrac{10^2 + 17^2 - 22^2}{2 \times 10 \times 17}$ oe Or **M1** for $22^2 = 10^2 + 17^2 - 2 \times 10 \times 17 \times \cos x$ oe	M2 soi by -0.2794117647 rot Or -95/340
	(b)		48.3 to 49	6	**M1** for ½ × 10 × 17 × sin106 oe **AND** **M2** for $\dfrac{106}{360} \times \pi \times 6^2$ oe Or **B1** for $\dfrac{106}{360}$ or $\dfrac{360}{106}$ oe seen **AND** **M1** for *their* triangle – *their* sector soi **AND** **A1** for 81.6 to 82 Or for 33 to 33.3	Dep. on at least 1 previous M mark scored Accept 10.6π or better

5			$\dfrac{34}{360} \times \pi \times 7^2$	M2	Soi by 14.538…or 29.077…rot **M1** for [2 ×] $\pi \times 7^2$ soi	For the first **M2**, allow **M2** or **M1** if part of volume calculation
			$\dfrac{34}{360} \times \pi \times 14 \times 5$	M2	Soi by 20.769…rot **M1** for $\pi \times 14 \times 5$ soi	
					If **M0, M0**, then **SC1** for $\dfrac{34}{360}$ soi	
			2 × *their* top + *their* end only	M1		
			49.8 to 50	A1		

6	(a)		36 + 14.13 to 14.14 or 50.13 to 50.14	3	**M2** for 6×6 + ½×π×3² oe **Or M1** for [½×]π×3²	Soi by 36+14.1… or better Soi by 14.1… or better
	(b)		17.98 to 18.0	3	**M2** for √(16232.4 ÷ 50.1) oe **Or M1** for 16232.4 ÷ 50.1 soi by 324	Condone use of 16200