1		68.5	B1	for angle $OAB = 90°$ or angle $OCB = 90°$, may be seen on diagram
			P1	for a process to find the length of AB or the length of CB ($= 10\sqrt{3}$ oe) eg $10 \times \tan 60°$ ($= 17.3...$) or the length of OB ($= 20$), eg $10 \div \cos 60°$
			P1	for a process (dep previous P1) to find the area of the triangle OAB ($= 50\sqrt{3}$ oe) or area of triangle OCB ($= 50\sqrt{3}$ oe) or area of kite $OABC$ ($= 100\sqrt{3}$ oe)
			P1	for a process to find the area of the sector OAC e.g. $\frac{1}{3} \times \pi \times 10^2$ ($= 104.7...$),accept rounded or truncated to 3 significant figures or more
			A1	for 68.4 – 68.6

2	25.4	P2	for finding the size of the angle eg $\frac{40 \times 360}{\pi \times 7^2}$ (=93.5(4..)) **or** for working with proportion, eg $\frac{40}{49\pi}$ (=0.259(8…) or 0.26) **or** $\frac{49\pi}{40}$ (=3.84(8…) or 3.85)	
		(P1	for finding the area of the circle eg $\pi \times 7^2$ (=153(.938..) or 154))	May be embedded
		P1	(dep on P2) for a process to find the arc length, eg $\frac{"93.5(4...)"}{360} \times \pi \times 2 \times 7$ (=11.4(28…)) **or** $\frac{40}{49\pi} \times \pi \times 2 \times 7$ (=11.4(28…)) **or** $\pi \times 2 \times 7 \div \frac{49\pi}{40}$ (=11.4(28…))	
		A1	for answer in the range 25 to 25.44	If an answer is shown in the range in working and then incorrectly rounded award full marks. Accept $\frac{178}{7}$

3	264	P1	correct substitution into the volume formula, eg $56.8 = \frac{1}{3} \times \pi \times r^2 \times 3.6$	
		P1	completes process to find base radius **or** the value of r^2, eg $r = \sqrt{\frac{56.8 \times 3}{\pi \times 3.6}}$ (=3.88158…) or $r^2 = \frac{56.8}{1.2\pi}$ (=15.066)	
		P1	Uses Pythagoras to find the sloping length, eg $\sqrt{"3.88..."^2 + 3.6^2}$ (=5.29…..)	
		P1	process to find an equation in AOB, eg $\pi \times "3.88" \times "5.29" = \frac{AOB}{360} \times \pi \times "5.29"^2$ **or** $\frac{AOB}{360} \times \pi \times 2 \times "5.29" = 2 \times \pi \times "3.88"$ **or** $\frac{AOB}{360} \times "5.29" = "3.88"$	AOB does not need to be the subject of the equation
		A1	answer in the range 263.9 to 264.1	

4	0.5	P1	derive an algebraic expression for the area of A eg $\frac{1}{8}\pi[(5x-1)^2 - (3x-1)^2]$	
		P1	expand and simplify for either area A or area B eg $\frac{1}{8}\pi(16x^2 - 4x)$ **or** $\pi(x^2 - 2x + 1)$	
		P1	(dep P2) equate and rearrange into a quadratic eqn of the form $ax^2 + bx + c = 0$ eg $2x^2 + 3x - 2 = 0$	
		P1	(dep P3) factorise eg $(2x - 1)(x + 2) = 0$ **or** use of formula eg $\frac{-3 \pm \sqrt{3^2 - 4 \times 2 \times -2}}{2 \times 2}$	
		A1	oe	Accept only the single value of 0.5 oe but award 0 marks for a correct answer with no supportive working

5	18.3	P1	for finding the area of the triangle eg $0.5 \times 8 \times 8$ (= 32)	Accept rounded or truncated figures
		P1	for finding the area of the circle $\pi \times 8 \times 8$ (= 201.06..)	
		P1	for finding the area of the sector eg $\frac{1}{4} \times \pi \times 8^2$ **or** "201.06.." ÷ 4 (= 50.26...)	
		A1	for an answer in the range 18.2 to 18.3	If the answer is given within the range but then rounded incorrectly award full marks.