

Question	Answer	Marks	Guidance
7(a)	Area of sector $BOF = \frac{1}{2} \times 20^2 \times (2\pi - 2.4)$ [=776.63...]	M1	Or combination of large semi-circle and small sector: $\frac{1}{2} \times 20^2 \times \pi + \frac{1}{2} \times 20^2 \times (\pi - 2.4)$.
	Length $BD = DF = 2 \times 20 \sin 0.6$ or $\sqrt{20^2 + 20^2 - 2 \times 20 \times 20 \cos 1.2}$ [=22.58...]	M1*	Length of radius of small circles is acceptable for M1.
	Area of two semicircles = $\pi \times (20 \sin 0.6)^2$ [=400.64...]	DM1	
	Area of triangles = $2 \times \frac{1}{2} \times 20 \times 20 \sin 1.2$ [=372.81...]	M1	
	Total area = 1550 [cm ²]	A1	Expect 1550.09 but accept AWRT to 3sf.
		5	
7(b)	$\frac{1}{2} \pi r^2 = 50\pi \Rightarrow r = 10$	B1	May be seen as $20 \sin \frac{\theta}{2}$, where $\theta = \frac{\pi}{3}$.
	$\Rightarrow \theta = \frac{\pi}{3}$	M1*	OE Finding θ using <i>their</i> r . Allow working in degrees.
	Arc length of sector $BOF = 20 \times \left(2\pi - \text{their } \frac{2\pi}{3} \right)$	DM1	
	Total perimeter = $20 \times \left(2\pi - \text{their } \frac{2\pi}{3} \right) + 2\pi \times \text{their } 10$	DM1	Dependent on the first dM1.
	$\frac{140\pi}{3}$ or $46\frac{2}{3}\pi$	A1	Must be a single exact term.
		5	