13	$[QR=]\dfrac{8}{\tan 40}$ **or** $\tan 40=\dfrac{8}{QR}$ or $\tan 50=\dfrac{QR}{8}$ or $\dfrac{QR}{\sin 50}=\dfrac{8}{\sin 40}$ oe $[PR=]\dfrac{8}{\sin 40}$ or $\dfrac{8}{\cos 50}$ $(=12.445\ldots)$ or $\sin 40=\dfrac{8}{PR}$ or $\cos 50=\dfrac{8}{PR}$ oe		4	M1 for a correct method or expression to find *QR* **or** *PR*. Allow any letter(s) for *QR*/*PR* or mislabelling or equivalents eg $[QR=]\ 8\tan 50(=9.534...)$ If no working shown allow for awrt 12 or awrt 10
	eg $[QR=]\dfrac{8}{\tan 40}(=9.534...)$ **AND** $[PR=]\dfrac{8}{\sin 40}$ or $\dfrac{"QR"}{\cos 40}$ $(=12.445\ldots)$ oe **or** $[QR=]\dfrac{8}{\tan 40}(=9.534...)$ **AND** $[PR=]\sqrt{8^2+"9.534..."^2}$ $(=12.445\ldots)$ oe **or** $[PR=]\dfrac{8}{\sin 40}(=12.445\ldots)$ **AND** $[QR=]\sqrt{"12.445..."^2-8^2}(=9.534...)$ oe **or** area of $PTR=0.5\times\pi\times\left(\dfrac{"12.445..."}{2}\right)^2$ $[=60.8...]$ **or** area of $PQR=\dfrac{1}{2}\times 8\times"9.534..."$ **or** $\dfrac{1}{2}\times 8\times"12.445..."\times\sin(90-40)$ **or** $\dfrac{1}{2}\times"12.445..."\times"9.534..."\sin 40$ $[=38.1...]$			M1 dependent on first M1 being awarded for a correct method or expression to find *QR* **AND** *PR* or 0.5*PR*. Allow equivalent expressions eg those allowed for the 1st M1 **NB** $\dfrac{PR}{\sin 90}=\dfrac{QR}{\sin 50}=\dfrac{8}{\sin 40}$ oe gains M1M1 **or** for a correct method to find the area of the semicircle *PTR* or a correct method to find area of *PQR* using their *PR* (from correct working) and *PQ* = 8 Allow numbers written to 1 dp. When finding the areas "12.445" or "9.534" must come from correct working.
	$0.5\times"9.534\ldots"\times 8+0.5\times\pi\times\left(\dfrac{"12.445"}{2}\right)^2$ or $0.5\times 8\times"12.445..."\sin(50)+0.5\times\pi\times\left(\dfrac{"12.445"}{2}\right)^2$ or $0.5\times"12.445..."\times"9.534..."\sin(40)+0.5\times\pi\times\left(\dfrac{"12.445"}{2}\right)^2$			M1 correct method to find the whole area. If working is shown ft their *PR*(diameter) and/or *PQ* if clearly labelled or marked on the diagram or comes from correct working. Allow $\dfrac{"12.445..."}{2}$ or "6.22…" for the radius.
		99		A1 awrt 99 or awrt 98
	cas			**Total 4 marks**

Question	Working	Answer	Mark	Notes