Question number	Scheme	Marks
10 (a)	$\sin x + 1 = \cos x + 1 \Rightarrow \tan x = 1$	M1
	$x = \frac{\pi}{4}, \frac{5\pi}{4}$	A1 A1 (3)
(b)	Area R_1 :	
	$\int_{\frac{\pi}{4}}^{\frac{5\pi}{4}} (\sin x + 1) - (\cos x + 1)\,dx = \int_{\frac{\pi}{4}}^{\frac{5\pi}{4}} (\sin x - \cos x)\,dx$	M1
	$\left[-\cos x - \sin x\right]_{\frac{\pi}{4}}^{\frac{5\pi}{4}}$	M1
	$\left(\frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2}\right) - \left(-\frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2}\right) = 2\sqrt{2}$	M1 A1
	Area R_2 :	
	$\int_{\pi}^{\frac{5\pi}{4}} (\cos x + 1)\,dx + \int_{\frac{5\pi}{4}}^{\frac{3\pi}{2}} (\sin x + 1)\,dx$	M1
	$\left[\sin x + x\right]_{\pi}^{\frac{5\pi}{4}} + \left[-\cos x + x\right]_{\frac{5\pi}{4}}^{\frac{3\pi}{2}}$	A1
	$\left\lvert\left(-\frac{\sqrt{2}}{2} + \frac{5\pi}{4}\right) - \pi\right\rvert + \left\lvert\frac{3\pi}{2} - \left(\frac{\sqrt{2}}{2} + \frac{5\pi}{4}\right)\right\rvert = -\sqrt{2} + \frac{1}{2}\pi$	M1 A1
	area of R_1 : area of $R_2 = 2 : \left\{\frac{\pi\sqrt{2}}{4} - 1\right\}$ oe	A1 (9)
		Total 12 marks

Part	Mark	Notes
(a)	**M1**	For $\tan x = 1$
	A1	For $x = \frac{\pi}{4}$ [Allow 45º]
	A1	For $x = \frac{5\pi}{4}$ [Allow 225º]
(b)	**M1**	For stating $A = \int_{\frac{\pi}{4}}^{\frac{5\pi}{4}} \left(\sin x + 1\right) - \left(\cos x + 1\right) \mathrm{d}x$
	M1	For attempting to integrate their expression for the area. This must be correct for this mark. $\int \left(\sin x - \cos x\right)\ \mathrm{d}x = -\cos x - \sin x$
	M1	For substitution of correct limits
	A1	For $2\sqrt{2}$
	M1	For attempting $\int \mathrm{f}(x)\mathrm{d}x + \int \mathrm{g}(x)\mathrm{d}x$ with the correct limits. $\int_{\pi}^{\frac{5\pi}{4}} \left(\cos x + 1\right)\mathrm{d}x + \int_{\frac{5\pi}{4}}^{\frac{3\pi}{2}} \left(\sin x + 1\right)\mathrm{d}x$
	M1	For attempting to integrate, which must be correct for this mark.
	M1	For substitution of their limits correctly.
	A1	For $-\sqrt{2} + \frac{1}{2}\pi$
	A1	For the simplified ratio $2 : \left(\frac{\pi\sqrt{2}}{4} - 1\right)$