Question			Answer	Marks	AOs	Guidance	
11	(a)	(i)	$f'(x) = e^{-x}\cos x - e^{-x}\sin x$	M1 A1	3.1a 1.1	product rule correct	
			$f'(x) = 0$ and $e^{-x} \neq 0 \Rightarrow \cos x = \sin x$	E1	2.2a		
			$\Rightarrow \tan x = 1$	M1	1.1	Use of $\frac{\sin}{\cos} = \tan$	
			$\Rightarrow x = \frac{\pi}{4}, \frac{5\pi}{4}, \frac{9\pi}{4}, \frac{13\pi}{4}$	A1	1.1	$x = \frac{\pi}{4}$ (condone 45°) $\frac{\pi}{4}, \frac{5\pi}{4}, \frac{9\pi}{4}, \ldots$	
			So an AP with $d = \pi$	E1FT	2.1	must state the common difference	FT their values of x
		(ii)	$y = \frac{\sqrt{2}}{2}e^{-\frac{\pi}{4}}, -\frac{\sqrt{2}}{2}e^{-\frac{5\pi}{4}}, \frac{\sqrt{2}}{2}e^{-\frac{9\pi}{4}}, -\frac{\sqrt{2}}{2}e^{-\frac{13\pi}{4}}$	M1 A1	3.1a 1.1	substituting one value of x into $f(x)$	
			This is a GP with $r = -e^{-\pi}$	E1FT [9]	2.1	must state common ratio, www	FT their values of y
11	(b)		Yes with explanation that values of x would continue to be separated by pi and so values of y would continue to have same common ratio.	E1 [1]	2.2a		