Question	Scheme	Marks	AOs
8(a)	$\dfrac{\sin 2\theta + \sin\theta}{\cos 2\theta + \cos\theta + 1} \equiv \dfrac{2\sin\theta\cos\theta + \sin\theta}{\dots}$ **or** $\dfrac{\dots}{2\cos^2\theta - 1 + \cos\theta + 1}$	M1	1.1b
	$\dfrac{\sin 2\theta + \sin\theta}{\cos 2\theta + \cos\theta + 1} \equiv \dfrac{2\sin\theta\cos\theta + \sin\theta}{2\cos^2\theta - 1 + \cos\theta + 1}$	M1	2.1
	$\equiv \dfrac{\sin\theta(2\cos\theta + 1)}{\cos\theta(2\cos\theta + 1)} = \tan\theta$ *	A1*	2.2a
		(3)	
(b)	$\dfrac{\sin 2x + \sin x}{\cos 2x + \cos x + 1} = 2\cos x \Rightarrow \tan x = 2\cos x$ $\Rightarrow \sin x = 2\cos^2 x = 2(1 - \sin^2 x)$	M1	3.1a
	$\Rightarrow 2\sin^2 x + \sin x - 2 = 0$	A1	1.1b
	$\sin x = \dfrac{-1 \pm \sqrt{17}}{4}(0.780\dots, -1.280\dots) \Rightarrow x = \dots$	dM1	1.1b
	$x = 0.896,\ 2.246$	A1 A1	1.1b 1.1b
		(5)	
			(8 marks)

Notes

(a)

M1: Applies $\sin 2\theta = 2\sin\theta\cos\theta$ in the numerator **or** $\cos 2\theta = 2\cos^2\theta - 1$ in the denominator

M1: Applies $\sin 2\theta = 2\sin\theta\cos\theta$ in the numerator **and** $\cos 2\theta = 2\cos^2\theta - 1$ in the denominator

A1*: Factorises to show cancelling and reaches $\tan\theta$ with no errors

(b)

M1: Makes the connection with part (a), multiplies by $\cos x$, applies $\cos^2 x = 1 - \sin^2 x$ and collects terms to obtain a 3TQ in $\sin x$

A1: Correct 3TQ

dM1: Solves a 3TQ in $\sin x$ and obtains at least one value for x

A1: Awrt one correct value

A1: Both correct, allowing awrt, and no other values in range