

Question			Answer	Mark	AO	Guidance
4	(a)		$\text{LHS} \equiv \frac{\cos^2 \theta - (1 - \sin \theta)}{(1 - \sin \theta) \cos \theta}$ $\equiv \frac{-\sin^2 \theta + \sin \theta}{(1 - \sin \theta) \cos \theta}$ $\equiv \frac{\sin \theta(1 - \sin \theta)}{(1 - \sin \theta) \cos \theta} \equiv \frac{\sin \theta}{\cos \theta} \equiv \tan \theta \text{ AG}$	M1*	3.1a	Collect over common denominator. Allow sign error.
				M1 dep*	1.1	Use of $\sin^2 \theta + \cos^2 \theta \equiv 1$ so that the numerator is in $\sin \theta$ only. Allow sign error in numerator.
				A1	2.1	Correct completion to AG www
			Alternative method 1: $\frac{\cos^2 \theta}{(1 - \sin \theta) \cos \theta} - \frac{1}{\cos \theta} \equiv \frac{(1 - \sin^2 \theta)}{(1 - \sin \theta) \cos \theta} - \frac{1}{\cos \theta}$ $\equiv \frac{(1 - \sin \theta)(1 + \sin \theta)}{(1 - \sin \theta) \cos \theta} - \frac{1}{\cos \theta}$ $\equiv \frac{1 + \sin \theta}{\cos \theta} - \frac{1}{\cos \theta} \equiv \frac{\sin \theta}{\cos \theta} \equiv \tan \theta \text{ AG}$	M1*		Multiply first term by $\frac{\cos \theta}{\cos \theta}$ and use $\sin^2 \theta + \cos^2 \theta \equiv 1$ so that the numerator is in $\sin \theta$ only.
				M1 dep*		Using difference of two squares in first term.
				A1		Correct completion to AG www
			Alternative method 2: $\frac{\cos \theta(1 + \sin \theta)}{(1 - \sin \theta)(1 + \sin \theta)} - \frac{1}{\cos \theta} \left[\equiv \frac{\cos \theta(1 + \sin \theta)}{1 - \sin^2 \theta} - \frac{1}{\cos \theta} \right]$ $\equiv \frac{\cos \theta + \cos \theta \sin \theta}{\cos^2 \theta} - \frac{1}{\cos \theta} \left[\equiv \frac{1 + \sin \theta}{\cos \theta} - \frac{1}{\cos \theta} \right]$ $\equiv \frac{1 + \sin \theta - 1}{\cos \theta} \equiv \frac{\sin \theta}{\cos \theta} \equiv \tan \theta \text{ AG}$	M1*		Multiply first term by $\frac{1 + \sin \theta}{1 + \sin \theta}$
				M1 dep*		Use of $\sin^2 \theta + \cos^2 \theta \equiv 1$ so that the denominator is in $\cos \theta$ only.
				A1		Correct completion to AG www
				[3]		May see variations on each method and/or equivalent work done to both sides of identity in 'parallel' – mark to either method above as each step appears.
4	(b)		$\tan 3x = 1$ $\tan^{-1}(1)$ $[3x =] 45^\circ \text{ or } 225^\circ$ $x = 15^\circ \text{ or } 75^\circ$	B1	3.1a	soi
				M1	1.1	soi, eg by 45° seen
				A1	1.1	Both, ignore extras (may be implied by final A1)
				A1	1.1	Both, no extras
				[4]		