6	**(a)**		$\text{LHS}=\dfrac{\sin^2\theta-(1-\cos\theta)}{(1-\cos\theta)\sin\theta}$ $=\dfrac{(1-\cos^2\theta)+\cos\theta-1}{(1-\cos\theta)\sin\theta}$ $=\dfrac{\cos\theta(1-\cos\theta)}{\sin\theta(1-\cos\theta)}$ $=\cot\theta$	**M1** **B1** **M1** **A1** **[4]**	**2.1** **2.1** **2.1** **2.1**	Attempt to write LHS as a single fraction Use of identity $\sin^2\theta=1-\cos^2\theta$ Algebraic manipulation eg factorising the numerator **AG** Complete proof	Where candidates manipulate the entire statement, allow M1 for eliminating or combining fractions eg multiplying through by $(1-\cos\theta)\sin\theta$ M1 for algebraic manipulation leading to a known identity B1 identity obtained. A1 Complete proof
			Alternative solution $\dfrac{\sin\theta}{(1-\cos\theta)}\dfrac{(1+\cos\theta)}{(1+\cos\theta)}=\dfrac{\sin\theta(1+\cos\theta)}{\sin^2\theta}$ So LHS becomes $\dfrac{(1+\cos\theta)}{\sin\theta}-\dfrac{1}{\sin\theta}=\dfrac{\cos\theta}{\sin\theta}=\cot\theta$	**M1** **B1** **M1** **A1**		Attempt to change the denominator of the fraction Use of trig identity Combining the fractions **AG** Complete proof	
6	**(b)**		Uses $\dfrac{1}{\tan\theta}=3\tan\theta$ $\tan\theta=\pm\dfrac{1}{\sqrt{3}}$ $\theta=\dfrac{\pi}{6},\ \dfrac{5\pi}{6}$	**M1** **M1** **A1** **[3]**	**1.1a** **1.1a** **1.1b**	soi. Also allow for equivalent equation in $\cot\theta$ Method must be clearly using the given answer in **(a)** Do not allow if additional answers in the interval; ignore additional values outside the interval.	Allow positive root only for second M mark