

Q	Marking Instructions	AO	Marks	Typical Solution
9(a)	Uses $\operatorname{cosec}2\theta = \frac{1}{\sin 2\theta}$ and $\cot 2\theta = \frac{\cos 2\theta}{\sin 2\theta}$	1.2	B1	$\frac{1}{\sin 2\theta} + \frac{\cos 2\theta}{\sin 2\theta}$ $= \frac{1 + \cos 2\theta}{\sin 2\theta}$ $= \frac{1 + \cos^2 \theta - \sin^2 \theta}{2 \sin \theta \cos \theta}$ $= \frac{2 \cos^2 \theta}{2 \sin \theta \cos \theta}$ $= \frac{\cos \theta}{\sin \theta} = \cot \theta$
	Uses the identity for $\sin 2\theta = 2 \sin \theta \cos \theta$ or an identity for $\cos 2\theta = \cos^2 \theta - \sin^2 \theta$ or $2 \cos^2 \theta - 1$ or $1 - 2 \sin^2 \theta$ to commence proof	2.1	M1	
	Uses the identities for $\sin 2\theta$ and $\cos 2\theta$ in correct proof	1.1b	A1	
	Completes a reasoned argument leading to a single trigonometric fraction to prove given identity AG	2.1	R1	
9(b)	Deduces that when $\cos \theta = 0$ then $\cot \theta$ is defined/zero/exists on LHS but $\operatorname{cosec} 2\theta$ or $\cot 2\theta$ or $\frac{1}{2 \sin \theta \cos \theta}$ or $\frac{1}{\sin 2\theta}$ is undefined on RHS or deduces that LHS is defined but RHS is undefined Must compare both LHS and RHS	2.2a	E1	When $\cos \theta = 0$ the value of $\cot \theta = 0$ on LHS but because the value of $\sin 2\theta = 0$, $\operatorname{cosec} 2\theta$ and $\cot 2\theta$ are undefined on RHS.
	Total		5	