

$$\csc 2a + \cot 2a = \cot a$$

Solution:

$$\begin{aligned}\csc 2a + \cot 2a &= \frac{1}{\sin 2a} + \frac{\cos 2a}{\sin 2a} = \frac{1 + \cos 2a}{\sin 2a} = \frac{\sin^2 a + \cos^2 a + \cos^2 a - \sin^2 a}{\sin 2a} = \\ &= \frac{2 \cos^2 a}{2 \sin a \cos a} = \frac{\cos a}{\sin a} = \cot a\end{aligned}$$