

9. (a) Prove that

$$\tan \theta + \cot \theta \equiv 2 \operatorname{cosec} 2\theta, \quad \theta \neq \frac{n\pi}{2}, n \in \mathbb{Z}$$

(4)

(b) Hence explain why the equation

$$\tan \theta + \cot \theta = 1$$

does not have any real solutions.

(1)