

12. (a) Prove

$$\frac{\cos 3\theta}{\sin \theta} + \frac{\sin 3\theta}{\cos \theta} \equiv 2 \cot 2\theta \quad \theta \neq (90n)^\circ, n \in \mathbb{Z} \quad (4)$$

(b) Hence solve, for  $90^\circ < \theta < 180^\circ$ , the equation

$$\frac{\cos 3\theta}{\sin \theta} + \frac{\sin 3\theta}{\cos \theta} = 4$$

giving any solutions to one decimal place.

(3)