

8.**In this question you must show all stages of your working.****Solutions relying entirely on calculator technology are not acceptable.**

(a) Prove that

$$\frac{1}{\operatorname{cosec} \theta - 1} + \frac{1}{\operatorname{cosec} \theta + 1} \equiv 2 \tan \theta \sec \theta \quad \theta \neq (90n)^\circ, n \in \mathbb{Z} \quad (3)$$

(b) Hence solve, for $0 < x < 90^\circ$, the equation

$$\frac{1}{\operatorname{cosec} 2x - 1} + \frac{1}{\operatorname{cosec} 2x + 1} = \cot 2x \sec 2x$$

Give each answer, in degrees, to one decimal place.

(4)