8. **In this question you must show all stages of your working.**

Solutions relying entirely on calculator technology are not acceptable.

(a) Show that

$$\frac{1-\cos 2\theta}{\sin^2 2\theta} \equiv k\sec^2\theta \qquad \theta \neq \frac{n\pi}{2} \qquad n \in \mathbb{Z}$$

where k is a constant to be found.

(3)

(b) Hence solve, for $-\frac{\pi}{2} < x < \frac{\pi}{2}$

$$\frac{1-\cos 2x}{\sin^2 2x} = (1+2\tan x)^2$$

Give your answers to 3 significant figures where appropriate.

(4)