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

(a) Prove that

$$\frac{\tan\theta\left(16+9\sin^2\theta\right)}{3\sin\theta+5\tan\theta}\equiv 5-3\cos\theta \qquad \theta\neq(90n)^\circ \qquad n\in\mathbb{Z}$$

**(4)**

(b) Hence solve for $0 < x < 180^\circ$

$$\frac{\tan 2x\left(16+9\sin^2 2x\right)}{3\sin 2x+5\tan 2x}=\frac{4}{\cos 2x}-3$$

giving your answers to one decimal place.

**(4)**