

**8 (a)** Prove the identity  $\frac{\sin 2x}{1 + \tan^2 x} \equiv 2 \sin x \cos^3 x$

**[3 marks]**

**8 (b)** Hence find  $\int \frac{4 \sin 4\theta}{1 + \tan^2 2\theta} d\theta$

**[6 marks]**