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## Prove Trig Equation | Past Paper Question | Pure Maths 1 Specimen Edexcel Q9a

Prove  $\tan \theta + \cot \theta \equiv 2 \operatorname{cosec} 2\theta$

$$\begin{aligned} \text{Proof: } \tan \theta + \cot \theta &\equiv \frac{\sin \theta}{\cos \theta} + \frac{\cos \theta}{\sin \theta} \\ &\equiv \frac{\sin^2 \theta + \cos^2 \theta}{\cos \theta \sin \theta} \end{aligned}$$

$$\begin{aligned} \operatorname{cosec} 2\theta &\equiv \frac{1}{\sin 2\theta} \\ &\equiv \frac{1}{2 \sin \theta \cos \theta} \end{aligned}$$

$$\equiv \frac{2}{2} \times \frac{1}{\cos \theta \sin \theta}$$

$$\equiv \frac{2}{\sin 2\theta}$$

$$\equiv 2 \operatorname{cosec} 2\theta$$



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