



Air maths tuition

Interact, engage and perform

Trigonometric Identities to Prove 5

Prove $\frac{1-\cos\theta}{\sin\theta} \equiv \frac{1}{\operatorname{cosec}\theta + \cot\theta}$

$$\sin^2\theta + \cos^2\theta \equiv 1$$

Proof:

$$\begin{aligned} \frac{1}{\operatorname{cosec}\theta + \cot\theta} &\equiv \frac{1}{\frac{1}{\sin\theta} + \frac{\cos\theta}{\sin\theta}} \quad \frac{\sin\theta}{\sin\theta} \\ &\equiv \frac{\sin\theta}{(1 + \cos\theta)} \quad \frac{(1-\cos\theta)}{(1-\cos\theta)} \\ &\equiv \frac{\sin\theta(1-\cos\theta)}{1 - \cos^2\theta} \\ &\equiv \frac{\cancel{\sin\theta}(1-\cos\theta)}{\sin^2\theta} \\ &\equiv \frac{1-\cos\theta}{\sin\theta} \end{aligned}$$

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