

## Answer to Question #86062 - Math - Trigonometry

### Question

Prove that

$$\frac{\sin A + \sin 2A}{1 + \cos A + \cos 2A} = \tan A$$

### Solution

$$\frac{\sin A + \sin 2A}{1 + \cos A + \cos 2A} = \frac{\sin A + 2 \sin A \cos A}{1 + \cos A + 2 \cos^2 A - 1} \quad (\sin 2A = 2 \sin A \cos A; \cos 2A = 2 \cos^2 A - 1)$$

$$\frac{\sin A + \sin 2A}{1 + \cos A + \cos 2A} = \frac{\sin A(1 + 2 \cos A)}{\cos A + 2 \cos^2 A}$$

$$\frac{\sin A + \sin 2A}{1 + \cos A + \cos 2A} = \frac{\sin A(1 + 2 \cos A)}{\cos A(1 + 2 \cos A)}$$

$$\frac{\sin A + \sin 2A}{1 + \cos A + \cos 2A} = \frac{\sin A}{\cos A}$$

$$\frac{\sin A + \sin 2A}{1 + \cos A + \cos 2A} = \tan A$$

Q.E.D.