Key

Prove the following identities:

$\csc\theta\cos\theta = \cot\theta$

$\left(\frac{1}{\sin\theta}\right)\cos\theta$

$\frac{\cos\theta}{\sin\theta}$

$\cot\theta$

$\frac{\sin\theta}{\cos\theta} + \frac{\cos\theta}{\sin\theta} = \csc\theta\sec\theta$

$\sin\theta \quad \cos\theta$

$\frac{\sin^2\theta}{\sin\theta\cos\theta} + \frac{\cos^2\theta}{\sin\theta\cos\theta}$

$\frac{\sin^2\theta + \cos^2\theta}{\sin\theta\cos\theta}$

$\frac{1}{\sin\theta\cos\theta}$

$\csc\theta\sec\theta$

$\frac{\sin x}{1+\cos x} = \frac{1-\cos x}{\sin x} \cdot \frac{(1+\cos x)}{(1+\cos x)}$

$\frac{1-\cos^2 x}{\sin x(1+\cos x)}$

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

$\frac{\sin x}{1+\cos x}$

$$\frac{\sin x - \sin^3 x}{\cos^3 x} = \tan x$$

$$\frac{\sin x(1-\sin^2 x)}{\cos^3 x}$$

$$\frac{\sin x(\cos^2 x)}{\cos^3 x}$$

$$\frac{\sin x}{\cos x}$$

$$\tan x$$

$$\frac{\cos 2x - 1}{\sin 2x} = -\tan x$$

$$\frac{1-2\sin^2 x - 1}{2\sin x \cos x}$$

$$\frac{-2\sin^2 x}{2\sin x \cos x}$$

$$\frac{-\sin x}{\cos x}$$

$$-\tan x$$

$$(1-\cos x)^2 + \sin^2 x = 2(1-\cos x)$$

$$1 - 2\cos x + \cos^2 x + \sin^2 x$$

$$1 - 2\cos x + 1$$

$$2 - 2\cos x$$

$$2(1-\cos x)$$