

Pythagorean Identity.

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

$$\cos^2 \theta + \left(\frac{1}{\cos \theta}\right)^2 = 1$$

$$\cancel{\cos^2 \theta} \left(\cos^2 \theta + \frac{1}{\cos^2 \theta} \right) = (1) \cancel{\cos^2 \theta}$$

$$\cos^2 \theta \cos^2 \theta + \frac{1}{\cos^2 \theta} = \cos^2 \theta + \frac{1}{\cos^2 \theta}$$

$$\frac{\cos^2 \theta}{\cos^2 \theta} + \frac{\sin^2 \theta}{\cos^2 \theta} = \frac{1}{\cos^2 \theta} + \frac{\sin^2 \theta}{\cos^2 \theta}$$

$$\boxed{\cot^2 \theta + 1 = \csc^2 \theta} \text{ (Identity 3)}$$

$$* \cos^2 \theta = \cot^2 \theta = \frac{\sin^2 \theta}{\cos^2 \theta}$$

Show this is an identity. (s=s)

* first change to sin & cos

$$\frac{1}{\tan^2 \theta} + \tan^2 \theta \cdot \cos^2 \theta = 1$$

$$\sec^2 \theta + \frac{\cos^2 \theta}{\sin^2 \theta} \cdot \cos^2 \theta = 1$$

$$\boxed{\cos^2 \theta + \sin^2 \theta = 1}$$

$$\boxed{1 = 1}$$

Pythagorean Identity = 1