

PROCEDURES FOR PROVING IDENTITIES

1. If one side contains one function only, write all trigonometric functions on the other side in terms of that function.

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

$$1 - \sin^2 \theta - \sin^2 \theta$$

2. Change all trigonometric functions to **SIN X** and **COS X** and simplify.

$$\sin x \sec x \cot x = 1$$

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

3. Simplify by combining fractions.

$$\frac{\sec x}{\sin x} - \frac{\sin x}{\cos x} = \cot x$$

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

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

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

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

4. Factoring is sometimes helpful.
$$\frac{\cos^2 x - 3 \cos x - 4}{\cos x + 1} = \cos x - 4$$

$$\frac{(\cos x - 4)(\cos x + 1)}{\cos x + 1}$$

5. Multiply by the conjugate of either the numerator or denominator.
6. If there are squares of functions, look for alternate forms of the Pythagorean Identities.
7. Avoid the introduction of radicals.
8. If the denominator of a fraction consists of only one function, break up the fraction.