

### Identities Quiz Review WS #3

Reciprocal Identities:

$$\sin \theta = \frac{1}{\csc \theta}$$

$$\csc \theta = \frac{1}{\sin \theta}$$

$$\cos \theta = \frac{1}{\sec \theta}$$

$$\sec \theta = \frac{1}{\cos \theta}$$

$$\tan \theta = \frac{1}{\cot \theta}$$

$$\cot \theta = \frac{1}{\tan \theta}$$

Quotient Identities:

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

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

Pythagorean Identities:

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

$$\tan^2 \theta + 1 = \sec^2 \theta$$

$$1 + \cot^2 \theta = \csc^2 \theta$$

Verify the Identity

1)  $\sec^2 \theta (1 - \cos^2 \theta) = \tan^2 \theta$

2)  $\cot^2 \theta \csc^2 \theta - \cot^2 \theta = \cot^4 \theta$

3)  $\frac{\sec \theta}{\sin \theta} - \frac{\sin \theta}{\cos \theta} = \cot \theta$

4)  $\frac{\sin \theta}{1 - \cos \theta} + \frac{1 - \cos \theta}{\sin \theta} = 2 \csc \theta$

$$5) \frac{\cos \theta}{1 + \sin \theta} + \frac{\cos \theta}{1 - \sin \theta} = 2 \sec \theta$$

$$6) \csc^4 \theta - \cot^4 \theta = 2 \cot^2 \theta + 1$$

$$7) \frac{\csc^2 \theta + 2 \csc \theta - 3}{\csc^2 \theta - 1} = \frac{\csc \theta + 3}{\csc \theta + 1}$$

$$8) \frac{1 + \cos x}{\sin x} = \csc x + \cot x$$