

Name: _____

Date: _____

Pre Calculus 12 Ch6 Trigonometric Identities Review:

1. Solve the following equations for $0 \leq \theta \leq 2\pi$. Use the trigonometric Identities shown in class. Show all your work and steps:

i) $\cos 2\theta = \cos^2 \theta$

ii) $\cos \theta \sin \theta = \frac{1}{4}$

iii) $\cos 2\theta - \cos \theta = 0$

iv) $\cos(\theta + \pi) - \cos^2 \theta = 0$

v) $\sin^2 \theta + 2 \cos^2 \theta = \frac{7}{4}$

vi) $3 - 3 \csc \theta + \cot^2 \theta = 0$

$$\text{vii) } 2 \sin^2 \theta - \cos \theta - 1 = 0$$

$$\text{ix) } 2 \sin^2 \theta - 5 \sin \theta - 3 = 0$$

$$\text{x) } 3 \cos^2 \theta - 8 \cos \theta + 4 = 0$$

2. Prove the following Identities. Also indicate any restrictions on the domain:

$$\text{i) } \csc \theta \sin 2\theta - \sec \theta \cos 2\theta = \sec \theta$$

$$\text{ii) } \frac{\sin \theta}{1 - \sin \theta} + \frac{\sin \theta}{1 + \sin \theta} = 2 \sin 2\theta \sec^3 \theta$$

$$\text{iii) } \frac{\tan \theta (\cos \theta + \cot \theta)}{\sec \theta + \tan \theta} = \frac{\sin \theta \sin 2\theta}{2 - 2 \cos^2 \theta}$$

$$\text{iv) } \frac{\cos \theta + \sin \theta \tan \theta}{\sin \theta \sec \theta} = \csc \theta$$

$$\text{v) } \frac{\tan \theta}{\sec \theta + 1} = \frac{2 \cos \theta - 2 \cos^2 \theta}{\sin 2\theta}$$

$$\text{vi) } \frac{\sin 2\theta + \sin \theta}{1 + \cos \theta + \cos 2\theta} = \cot \left(\frac{\pi}{2} - \theta \right)$$

$$\text{vii) } (\sec \theta - \cos \theta)(\csc \theta - \sin \theta) = \frac{\tan \theta}{1 + \tan^2 \theta}$$

3. Determine the restriction(s) for each of the following expressions:

$$\text{i) } \frac{\sec \theta}{2 \sin \theta + 1}$$

$$\text{ii) } \frac{\sin \theta \sec \theta}{\cot \theta}$$

$$\text{iii) } \frac{\sec^2 \theta - 1}{1 + \tan^2 \theta}$$

$$\text{iv) } \frac{\cos \theta}{1 + \sin \theta} + \frac{\cos \theta}{1 - \sin \theta}$$

$$\text{v) } \frac{1 + \cos^2 \theta - \sin \theta}{\sin \theta \cos \theta \tan \theta}$$

$$\text{vi) } \frac{\cos 2\theta - 1}{3 \sin 2\theta - 2}$$