

Name _____

Date _____

Period _____

Homework 10.2 Part 2

Analytically show that the equations below represent trigonometric identity statements.

1. $\frac{\tan \alpha}{\sec \alpha} = \tan \alpha \cos \alpha$

$$\tan \alpha \cos \alpha = \tan \alpha \cos \alpha$$

2. $\frac{\sin^2 \theta}{\cos \theta} = \sec \theta - \cos \theta$

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

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

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

3. $\cot \theta + \tan \theta = \sec \theta \csc \theta$

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

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

$$\frac{\sec^2 \theta}{\tan \theta} =$$

$$\sec^2 \theta \cdot \cot \theta =$$

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

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

$$\sec \theta \csc \theta = \sec \theta \csc \theta$$

4. $\cot \theta \sin \theta = \cos^3 \theta + \cos \theta \sin^2 \theta$

$$\frac{\cos \theta}{\sin \theta} \cdot \sin \theta = \cos \theta (\cos^2 \theta + \sin^2 \theta)$$

$$= \cos \theta (1)$$

$$\cos \theta = \cos \theta$$

$$5. \frac{\csc \theta + \cot \theta}{\tan \theta + \sin \theta} = \cot \theta \csc \theta$$

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

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

$$\frac{\cancel{\sin \theta} \frac{1 + \cos \theta}{\cancel{\sin \theta}} \cos \theta}{\cancel{\sin \theta} \frac{\sin \theta + \sin \theta \cos \theta}{\cancel{\cos \theta}} \cos \theta} =$$

$$\frac{\cos \theta (1 + \cos \theta)}{\sin \theta (\sin \theta + \sin \theta \cos \theta)} =$$

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

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

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

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

$$6. \cot \theta \tan^3 \theta = \frac{\sin \theta \tan \theta}{\cos \theta}$$

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

$$\tan^2 \theta = \tan \theta \tan \theta$$

$$\tan^2 \theta = \tan^2 \theta$$