

Name: _____ Hour: _____ Date: _____

I. Simplify each of these expressions.

1. $\sin \theta \sec \theta$

2. $\frac{\sec x}{\csc x}$

3. $\cos^2 \theta (1 + \tan^2 \theta)$

4. $\frac{1 + \cos y}{1 + \sec y}$

5. $(\tan x)(\cos x)(\csc x)$

6. $\tan \theta + \cos(-\theta) + \tan(-\theta)$

II. Verify the identity

7. $\frac{\cos x \sec x}{\tan x} = \cot x$

8. $\cos(-x) - \sin(-x) = \cos x + \sin x$

9. $\tan \theta + \cot \theta = (\sec \theta)(\csc \theta)$

10. $(\sin x + \cos x)^2 = 1 + 2 \sin x \cos x$

$$11. (\tan y + \cot y) \sin y \cos y = 1$$

$$12. \frac{\csc x - \cot x}{\sec x - 1} = \cot x$$

$$13. \frac{\sin \theta - \csc \theta}{\cos \theta - \cot \theta} = \frac{\cos \theta}{1 - \sin \theta}$$

$$14. \cos t + \tan t \sin t = \sec t$$

$$15. (\tan x + \cot x)^4 = \csc^4 x \sec^4 x$$

(HINT: simplify $\tan x + \cot x$ as much as possible by adding fractions, then do power)

$$16. \frac{\cos \theta}{1 - \sin \theta} = \sec \theta + \tan \theta \quad (\text{HINT: multiply numerator and denominator by } 1 + \sin \theta)$$