

Name: _____

Date: _____

Trigonometric Identities

Practice 1

Each of these expressions can be simplified to a single expression using a trig function or number or combination thereof. Simplify each expression. Show any work.

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

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

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

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

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

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

Verify each identity by showing that one side can be simplified to look like the other. Show any work.

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

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

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

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

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

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

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

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

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

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

16. $\frac{\cos \theta}{1 - \sin \theta} = \sec \theta + \tan \theta$

(HINT: multiply numerator and denominator by $1 + \sin \theta$)