Name: _____

Date: _____ Class: Trigonometry, per: _____

Chapter 4: Trigonometric Identities - Worksheet & Review

Objective: I can prove trigonometric identities by transforming one side using fundamental identities and algebraic reasoning.

1. Prove the identity: $\tan x = \dfrac{\sin x}{\cos x}$.	**2.** Prove the identity: $\cot x = \dfrac{\cos x}{\sin x}$.
3. Prove the identity: $\sec x = \dfrac{1}{\cos x}$.	**4.** Prove the identity: $\csc x = \dfrac{1}{\sin x}$.
5. Prove the identity: $\sin^2 x + \cos^2 x = 1$.	**6.** Prove the identity: $1 + \tan^2 x = \sec^2 x$.
7. Prove the identity: $1 + \cot^2 x = \csc^2 x$.	**8.** Prove the identity: $\sec^2 x - \tan^2 x = 1$.
9. Prove the identity: $\csc^2 x - \cot^2 x = 1$.	**10.** Prove the identity: $\tan x \cot x = 1$.

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11. Prove the identity: $\sec x \cos x = 1$.	**12.** Prove the identity: $\csc x \sin x = 1$.
13. Prove the identity: $\dfrac{\tan x}{\sec x} = \sin x$.	**14.** Prove the identity: $\dfrac{\cot x}{\csc x} = \cos x$.
15. Prove the identity: $\tan x \csc x = \sec x$.	**16.** Prove the identity: $\cot x \sec x = \csc x$.
17. Prove the identity: $\sin x \sec x = \tan x$.	**18.** Prove the identity: $\cos x \csc x = \cot x$.
19. Prove the identity: $(\sec x - \tan x)(\sec x + \tan x) = 1$.	**20.** Prove the identity: $(\csc x - \cot x)(\csc x + \cot x) = 1$.

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21. Prove the identity: $\dfrac{1-\cos^2 x}{\sin x} = \sin x.$	**22.** Prove the identity: $\dfrac{1-\sin^2 x}{\cos x} = \cos x.$
23. Prove the identity: $\dfrac{\sec^2 x - 1}{\tan x} = \tan x.$	**24.** Prove the identity: $\dfrac{\csc^2 x - 1}{\cot x} = \cot x.$
25. Prove the identity: $\dfrac{\sec x - \cos x}{\tan x} = \sin x.$	**26.** Prove the identity: $\dfrac{\csc x - \sin x}{\cot x} = \cos x.$
27. Prove the identity: $\dfrac{\sin^2 x}{1+\cos x} = 1 - \cos x.$	**28.** Prove the identity: $\dfrac{\cos^2 x}{1+\sin x} = 1 - \sin x.$
29. Prove the identity: $\dfrac{1-\cos x}{\sin x} = \dfrac{\sin x}{1+\cos x}.$	**30.** Prove the identity: $\dfrac{1-\sin x}{\cos x} = \dfrac{\cos x}{1+\sin x}.$

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31. Prove the identity: $\sec x + \tan x = \dfrac{1+\sin x}{\cos x}$.	**32.** Prove the identity: $\sec x - \tan x = \dfrac{1-\sin x}{\cos x}$.
33. Prove the identity: $\csc x + \cot x = \dfrac{1+\cos x}{\sin x}$.	**34.** Prove the identity: $\csc x - \cot x = \dfrac{1-\cos x}{\sin x}$.
35. Prove the identity: $\tan x + \cot x = \sec x \csc x$.	**36.** Prove the identity: $\dfrac{\sec^2 x}{\tan x} = \tan x + \cot x$.
37. Prove the identity: $\dfrac{\csc^2 x}{\cot x} = \tan x + \cot x$.	**38.** Prove the identity: $\dfrac{\sin x}{1-\cos x} = \csc x + \cot x$.
39. Prove the identity: $\dfrac{\cos x}{1-\sin x} = \sec x + \tan x$.	**40.** Prove the identity: $\dfrac{\sin x}{1+\cos x} = \csc x - \cot x$.

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41. Prove the identity: $\dfrac{\cos x}{1+\sin x} = \sec x - \tan x.$	**42.** Prove the identity: $\sin 2x = 2\sin x \cos x.$
43. Prove the identity: $\cos 2x = \cos^2 x - \sin^2 x.$	**44.** Prove the identity: $\cos 2x = 1 - 2\sin^2 x.$
45. Prove the identity: $\cos 2x = 2\cos^2 x - 1.$	**46.** Prove the identity: $\sin\left(\frac{\pi}{2} - x\right) = \cos x.$
47. Prove the identity: $\cos\left(\frac{\pi}{2} - x\right) = \sin x.$	**48.** Prove the identity: $\sin(-x) = -\sin x.$
49. Prove the identity: $\cos(-x) = \cos x.$	**50.** Prove the identity: $\tan(-x) = -\tan x.$