

NAME

DATE

## Pre Calc : Identities A

In Exercises 1-40, verify the identity.

1.  $\sin t \csc t = 1$

2.  $\sec y \cos y = 1$

3.  $(1 + \sin \alpha)(1 - \sin \alpha) = \cos^2 \alpha$

4.  $\cot^2 y (\sec^2 y - 1) = 1$

5.  $\cos^2 \beta - \sin^2 \beta = 1 - 2 \sin^2 \beta$

6.  $\cos^2 \beta - \sin^2 \beta = 2 \cos^2 \beta - 1$

7.  $\tan^2 \theta + 4 = \sec^2 \theta + 3$

8.  $2 - \sec^2 z = 1 - \tan^2 z$

9.  $\sin^2 \alpha - \sin^4 \alpha = \cos^2 \alpha - \cos^4 \alpha$

10.  $\cos x + \sin x \tan x = \sec x$

11.  $\frac{\csc^2 \theta}{\cot \theta} = \csc \theta \sec \theta$

12.  $\frac{\cot^3 t}{\csc t} = \cos t (\csc^2 t - 1)$

13.  $\frac{\cot^2 t}{\csc t} = \csc t - \sin t$

14.  $\frac{1}{\tan \beta} + \tan \beta = \frac{\sec^2 \beta}{\tan \beta}$

15.  $\sin^{1/2} x \cos x - \sin^{5/2} x \cos x = \cos^3 x \sqrt{\sin x}$

16.  $\sec^6 x (\sec x \tan x) - \sec^4 x (\sec x \tan x) = \sec^5 x \tan^3 x$

17.  $\frac{1}{\sec x \tan x} = \csc x - \sin x$

18.  $\frac{\sec \theta - 1}{1 - \cos \theta} = \sec \theta$

19.  $\cot \alpha + \tan \alpha = \csc \alpha \sec \alpha$

20.  $\sec x - \cos x = \sin x \tan x$

21.  $\frac{1}{\tan x} + \frac{1}{\cot x} = \tan x + \cot x$

22.  $\frac{1}{\sin x} - \frac{1}{\csc x} = \csc x - \sin x$

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

24.  $\frac{1 + \sin \theta}{\cos \theta} + \frac{\cos \theta}{1 + \sin \theta} = 2 \sec \theta$

25.  $\frac{1}{\sin x + 1} + \frac{1}{\csc x + 1} = 1$

26.  $\cos x - \frac{\cos x}{1 - \tan x} = \frac{\sin x \cos x}{\sin x - \cos x}$

27.  $\tan\left(\frac{\pi}{2} - \theta\right) \tan \theta = 1$

28.  $\frac{\cos\left[\left(\frac{\pi}{2}\right) - x\right]}{\sin\left[\left(\frac{\pi}{2}\right) - x\right]} = \tan x$

29.  $\frac{\csc(-x)}{\sec(-x)} = -\cot x$

30.  $(1 + \sin y)[1 + \sin(-y)] = \cos^2 y$

31.  $\frac{\sin x \cos y + \cos x \sin y}{\cos x \cos y - \sin x \sin y} = \frac{\tan x + \tan y}{1 - \tan x \tan y}$

32.  $\frac{\tan x + \tan y}{1 - \tan x \tan y} = \frac{\cot x + \cot y}{\cot x \cot y - 1}$

33.  $\frac{\tan x + \cot y}{\tan x \cot y} = \tan y + \cot x$

34.  $\frac{\cos x - \cos y}{\sin x + \sin y} + \frac{\sin x - \sin y}{\cos x + \cos y} = 0$

35.  $\sqrt{\frac{1 + \sin \theta}{1 - \sin \theta}} = \frac{1 + \sin \theta}{|\cos \theta|}$

36.  $\sqrt{\frac{1 - \cos \theta}{1 + \cos \theta}} = \frac{1 - \cos \theta}{|\sin \theta|}$

37.  $\cos^2 \beta + \cos^2\left(\frac{\pi}{2} - \beta\right) = 1$

38.  $\sec^2 y - \cot^2\left(\frac{\pi}{2} - y\right) = 1$

39.  $\sin t \csc\left(\frac{\pi}{2} - t\right) = \tan t$

40.  $\sec^2\left(\frac{\pi}{2} - x\right) - 1 = \cot^2 x$