

NAME

DATE

Pre Calc : Identities

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

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