

Practice 8.2b: Verifying Trig Identities

Verify the following Trig IDs. Show your work

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

2. $\frac{\cos(90^\circ - \alpha)}{\sin(90^\circ - \alpha)} = \tan \alpha$

3. $\cos(90^\circ - \theta) \csc \theta = 1$

4. $\frac{\csc(-\sigma)}{\sec(-\sigma)} = -\cot \sigma$

5. $\frac{1}{\csc^2 x} + \frac{1}{\sec^2 x} = 1$

6. $\frac{\sec x - 1}{1 - \cos x} = \sec x$

7. $\csc x - \sin x = \cos x \cot x$

8. $\frac{\sec x + \tan x}{\sec x - \tan x} = (\sec x + \tan x)^2$

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

$$10. \cos x - \frac{\cos x}{1 - \tan x} = \frac{\sin x \cdot \cos x}{\sin x - \cos x}$$

$$11. 2\sec^2 x - 2\sec^2 x \sin^2 x - \sin^2 x - \cos^2 x = 1$$

$$12. \csc x(\csc x - \sin x) + \frac{\sin x - \cos x}{\sin x} + \cot x = \csc^2 x$$

$$13. 2 + \cos^2 x - 3\cos^4 x = \sin^2 x(2 + 3\cos^2 x)$$

$$14. \sec^4 \theta - \tan^4 \theta = 1 + 2\tan^2 \theta$$

$$15. \frac{\sin x}{1 - \cos x} = \frac{1 + \cos x}{\sin x}$$

$$16. \sqrt{\frac{1 + \sin x}{1 - \sin x}} = \frac{1 + \sin x}{|\cos x|}$$

Extra Credit.
$$\frac{\sin x \cdot \cos y + \cos x \cdot \sin y}{\cos x \cdot \cos y - \sin x \cdot \sin y} = \frac{\tan x + \tan y}{1 - \tan x \cdot \tan y}$$