9-2: Verifying Trigonometric Identities Practice

Verify each identity. Show all work. Make sure to justify each step.

1. $\dfrac{\csc^2 x - 1}{\csc^2 x} = \cos^2 x$

2. $2 \csc x = \dfrac{1}{\csc x + \cot x} + \dfrac{1}{\csc x - \cot x}$

3. $\dfrac{\sin x}{1 - \cos x} = \csc x + \cot x$

4. $\dfrac{\sin x}{\sec x - 1} = \cos x \cot x + \cot x$

5. $\cos x \sec^2 x \tan x - \cos x \tan^3 x = \sin x$

6. $\dfrac{\cos x}{1 - \sin x} - \dfrac{\cos x}{1 + \sin x} = 2 \tan x$

7. $\dfrac{\sin^4 x - \cos^4 x}{\sin^2 x - \cos^2 x} = 1$

8. $\tan^2 x = \csc^2 x \tan^2 x - 1$

Verify that the equation is *not* an identity by finding an **x value** for which the left side of the equation is not equal to the right side.

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

10. $\cos(x + 30°) = \cos x + \cos 30°$