14 Simplifying Trigonometric Expressions and Proving Trigonometric Identities Worksheet

Concepts:

- Expressions vs. Identities
- Simplifying Trigonometric Expressions
- Proving Trigonometric Identities
- Disproving Trigonometric Identities

(Section 7.1)

The following equations were taken from section 7.1 of your textbook. For each equation, determine if the equation is an identity. If it is an identity, prove that it is an identity. If it is not an identity, find a specific value of $x$ that shows the equation is not an identity.

1. $\cos(x) \sec(x) - \sin^2(x) = \cos^2(x)$
2. $\sec^4(x) - \tan^4(x) = 1 + 2 \tan^2(x)$
3. $(\cos^2(x) - 1)(\tan^2(x) + 1) = - \tan^2(x)$
4. $\sin^2(x)(\cot(x) + 1)^2 = \cos^2(x)(\tan(x) + 1)^2$
5. $\frac{1 + \sin(x)}{1 - \sin(x)} = \frac{\sec(x) + \tan(x)}{\sec(x) - \tan(x)}$  
6. $\ln(\cot(x)) = - \ln(\tan(x))$
7. $\frac{\sin(x) - \cos(x)}{\tan(x)} = -\frac{\tan(x)}{\sin(x) + \cos(x)}$
8. $\frac{\sec(x)}{\csc(x)} + \frac{\sin(x)}{\cos(x)} = 2 \tan(x)$
9. $\sin^2(x) - \tan^2(x) = -\sin^2(x) \tan^2(x)$
10. $\sec(x)(\sec(x) - \cos(x)) = \tan^2(x)$