Simplify each Expression.

1. $\cos x(\sec x - \cos x)$

2. $\dfrac{1}{\cot^2 x} - \sec^2 x$

3. $\dfrac{1}{\sec^2 \theta} + \dfrac{1}{\csc^2 \theta}$

4. $1 - \dfrac{\sin \theta}{\csc \theta}$

Verify each Identity.

5. $\tan^2 x - \sec^2 x = \dfrac{\sin^2 x - 1}{\cos^2 x}$

6. $\dfrac{1}{1 - \cos^2 x} = 1 + \cot^2 x$

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

8. $\dfrac{\sec x}{\sin x}(1 - \cos^2 x) = \tan x$

9. $\cos x(\tan x + \cot x) = \csc x$

10. $\csc^2 x(\sec^2 x - 1) = \dfrac{1}{\cos^2 x}$

11. $\dfrac{\csc x}{\cos x} = \tan x + \cot x$

12. $(\sec x - \tan x)^2 = \dfrac{1 - \sin x}{1 + \sin x}$