**Advanced Mathematics:** **Worksheet #4**

Proving Trigonometric Identities

Verify the following trigonometric identities.

1. $( \sin^4 A - \cos^4 A ) = 2 \sin^2 A - 1$

2. $\dfrac{1-\sin^2 A}{\sin A - 1} = \dfrac{-\csc A - 1}{\csc A}$

3. $1+\cos A = \cos A \ (\sec A + 1)$

4. $\sin^2 A = 1 - \dfrac{1}{\sec^2 A}$

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

6. $\dfrac{\csc A - \sec A}{\sec A} = \cot A - 1$

7. $\dfrac{\sec A}{\cos A} - 1 = \tan^2 A$

8. $\sin^2 A \cdot \cos A \cdot \sec A = 1 - \cos^2 A$

9. $\dfrac{1+\cot^2 A}{\csc A} = \dfrac{1}{\sin A}$

10. $\dfrac{\cos A}{\sec A} - \dfrac{\cot A}{\tan A} = -\cos^2 A \cdot \cot^2 A$

11. $\dfrac{\sin A}{1+\cos A} + \dfrac{\sin A}{1-\cos A} = \dfrac{2}{\sin A}$

12. $\dfrac{\sin^4 A - 1}{\cos^2 A} + 2 = \cos^2 A$