Advanced Mathematics   **Worksheet #5**
     Proving Trigonometric Identities

Verify the following trigonometric identities.

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

2. $\cos A = \tan A\,(\,\csc A - \sin A\,)$

3. $\dfrac{1}{1+\cos A} = \dfrac{\tan A}{\tan A + \sin A}$

4. $\dfrac{\sin A}{\cot A + \csc A} - \dfrac{\sin A}{\cot A - \csc A} = 2$

5. $\tan A + \cot A = \sec A \cdot \csc A$

6. $\dfrac{\cos A}{1+\sin A} + \dfrac{1+\sin A}{\cos A} = 2\sec A$

7. $\sin A = \cot A\,(\,\sec A - \cos A\,)$

8. $\csc A\,(\csc A + \cot A\,) = \dfrac{1}{1-\cos A}$

9. $\sqrt{\dfrac{1-\cos A}{1+\cos A}} = \dfrac{1-\cos A}{\sin A}$

10. $\dfrac{1+\sec A}{1-\sec A} = \dfrac{\cos A + 1}{\cos A - 1}$

11. $\cot^2 A - \cos^2 A = \cos^2 A \cdot \cot^2 A$

12. $\sec^2 A - \csc^2 A = \tan^2 A - \cot^2 A$

13. $\dfrac{\cos A \cdot \cot A - \tan A}{\csc A} = \dfrac{\cos A}{\sec A} - \dfrac{\sin A}{\cot A}$

14. $\csc A - \cot A \cdot \cos A = \sin A$

15. $\sqrt{\dfrac{\csc A - \cot A}{\csc A + \cot A}} = \dfrac{1-\cos A}{\sin A}$