PROBLEM SET 14-1
(Trigonometric Identities)

Establish the following identities.

1. $\sec\theta\cot\theta = \csc\theta$

2. $\sin\theta\sec\theta = \tan\theta$

3. $\cot\theta + \tan\theta = \sec\theta\csc\theta$

4. $\sec^2\theta - \csc^2\theta = \tan^2\theta - \cot^2\theta$

5. $\sin^2\theta\cot^2\theta + \cos^2\theta\tan^2\theta = 1$

6. $\sin\theta\cot\theta = \cos\theta$

7. $\dfrac{\sin\theta}{\tan\theta} = \cos\theta$

8. $\sec\theta - \cos\theta = \sin\theta\tan\theta$

9. $(1-\cos\theta)(1+\cos\theta) = \sin^2\theta$

10. $\cos\theta(\sec\theta + \cos\theta\csc^2\theta) = \csc^2\theta$

11. $\dfrac{1+\tan^2\theta}{\csc^2\theta} = \tan^2\theta$

12. $\dfrac{\sec\theta}{\sin\theta} - \dfrac{\sin\theta}{\cos\theta} = \cot\theta$

13. $\dfrac{\tan\theta}{\csc\theta} + \dfrac{\sin\theta}{\tan\theta} = \sec\theta$