Supplemental Worksheet #5

Prove each of the following identities.

1. $\sin\theta \cdot \sec\theta = \tan\theta$

2. $\cos\theta \cdot \csc\theta = \cot\theta$

3. $\dfrac{\sec\theta}{\csc\theta} = \tan\theta$

4. $1 - 2\cos^2\theta = 2\sin^2\theta - 1$

5. $\cos^2\theta \cdot \left(\sec^2\theta - 1\right) = 1 - \cos^2\theta$

6. $\left(1 + \sin\theta\right) \cdot \left(1 - \sin\theta\right) = \dfrac{1}{\sec^2\theta}$

7. $\tan^2\theta \cdot \left(1 - \sin^2\theta\right) = \sin^2\theta$

8. $\sin\theta \cdot \left(\csc\theta - \sin\theta\right) = \cos^2\theta$

9. $1 - \sin^2\theta \cdot \cot^2\theta = \cos^2\theta \cdot \tan^2\theta$

10. $\left(\tan^2\theta + 1\right) \cdot \left(1 - \sin^2\theta\right) = 1$

11. $\tan\theta + \cot\theta = \sec\theta \cdot \csc\theta$

12. $\dfrac{\sin\theta}{\csc\theta} + \dfrac{\cos\theta}{\sec\theta} = 1$

13. $\cot\theta + \dfrac{\sin\theta}{1 + \cos\theta} = \csc\theta$

14. $\dfrac{\tan\theta \cdot \sin^2\theta \cdot \cot\theta}{1 - \cos\theta} = 1 + \cos\theta$

15. $\tan\theta \cdot \sin\theta + \cos\theta = \sec\theta$

16. $\dfrac{\cos\theta}{1 - \cos\theta} + \dfrac{\cos\theta}{1 + \cos\theta} = 2\cot\theta \cdot \csc\theta$