

Establish each identity. Show all steps on your own paper.

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

2.  $1 + \tan^2(-\theta) = \sec^2 \theta$

3.  $\cos \theta(\tan \theta + \cot \theta) = \csc \theta$

4.  $\tan \theta \cot \theta - \cos^2 \theta = \sin^2 \theta$

5.  $(\sec \theta - 1)(\sec \theta + 1) = \tan^2 \theta$

6.  $(\sec \theta + \tan \theta)(\sec \theta - \tan \theta) = 1$

7.  $\sin^2 \theta(1 + \cot^2 \theta) = 1$

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

9.  $\sec^4 \theta - \sec^2 \theta = \tan^4 \theta + \tan^2 \theta$

10.  $\sec \theta - \tan \theta = \frac{\cos \theta}{1 + \sin \theta}$

11.  $3\sin^2 \theta + 4\cos^2 \theta = 3 + \cos^2 \theta$

12.  $1 - \frac{\cos^2 \theta}{1 + \sin \theta} = \sin \theta$

13.  $\frac{1 + \tan \theta}{1 - \tan \theta} = \frac{\cot \theta + 1}{\cot \theta - 1}$

14.  $\frac{\sec \theta}{\csc \theta} + \frac{\sin \theta}{\cos \theta} = 2 \tan \theta$

15.  $\frac{1 + \sin \theta}{1 - \sin \theta} = \frac{\csc \theta + 1}{\csc \theta - 1}$

16.  $\frac{1 - \sin \theta}{1 + \sin \theta} = (\sec \theta - \tan \theta)^2$

17.  $\tan \theta + \frac{\cos \theta}{1 + \sin \theta} = \sec \theta$