

U5D10 Worksheet    Extra Practice **Trigonometric Identities**

Prove the following identities:

1.  $\tan \theta \cos \theta = \sin \theta$

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

3.  $\sin \theta = \frac{\tan \theta}{\sec \theta}$

4.  $\csc \theta (1 + \sin \theta) = 1 + \csc \theta$

5.  $\cos \theta (\sec \theta - 1) = 1 - \cos \theta$

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

7.  $\sin \theta \tan \theta + \sec \theta = \frac{\sin^2 \theta + 1}{\cos \theta}$

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

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

10.  $\sin^2 \theta \cot^2 \theta = 1 - \sin^2 \theta$

11.  $\csc^2 \theta - 1 = \csc^2 \theta \cos^2 \theta$

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

13.  $\sin \theta \cos \theta \tan \theta = 1 - \cos^2 \theta$

14.  $\frac{\cos \theta}{1 + \sin \theta} + \frac{\cos \theta}{1 - \sin \theta} = 2 \sec \theta$

15.  $\frac{\sin \theta + \cos \theta}{\csc \theta + \sec \theta} = \sin \theta \cos \theta$

16.  $\frac{\tan \theta}{\sec \theta + 1} = \frac{\sec \theta - 1}{\tan \theta}$

17.  $\frac{1}{1 + \sin \theta} + \frac{1}{1 - \sin \theta} = 2 \sec^2 \theta$

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

19.  $(1 - \cos^2 \theta)(1 + \tan^2 \theta) = \tan^2 \theta$

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

21.  $\sec^2 \theta + \csc^2 \theta = \sec^2 \theta \csc^2 \theta$

22.  $\sin^2 \theta = \cos \theta (\sec \theta - \cos \theta)$

23.  $\frac{1}{1 + \cos \theta} = \csc^2 \theta - \frac{\cot \theta}{\sin \theta}$

24.  $\tan \theta + \tan^3 \theta = \frac{\sec^2 \theta}{\cot \theta}$

25.  $\frac{1 + \csc \theta}{\cot \theta} - \sec \theta = \tan \theta$

26.  $\frac{(1 - \cos^2 \theta)(\sec^2 \theta - 1)}{\cos^2 \theta} = \tan^4 \theta$