

Establish each identity:

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

2. $\frac{1 + \tan^2 x}{\csc^2 x} = \tan^2 x$

3. $\frac{\sin^2 u + \tan^2 u + \cos^2 u}{\sec u} = \sec u$

4. $(\sec^2 x + \csc^2 x) - (\tan^2 x + \cot^2 x) = 2$

5. $\frac{1}{1 - \cos x} - \frac{1}{1 + \cos x} = 2 \cot x \csc x$

6. $(\sin x)(\tan x + \cot x) = \sec x$

7. $\sin x \cdot \cos x \cdot \tan x \cdot \sec x \cdot \csc x = \tan x$

8. $\frac{1}{\sin^2 x} + \frac{\sec^2 x}{\tan^2 x} = 2 \csc^2 x$

$$9. \sec(-x)\cos(-x) = 1$$

$$10. \cot(-x)\tan(-x) = 1$$

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

$$12. \sin\theta(\cot\theta + \tan\theta) = \sec\theta$$

$$13. \sin^2 x(1 + \cot^2 x) = 1$$

$$14. \tan^2 \alpha \cos^2 \alpha + \cot^2 \alpha \sin^2 \alpha = 1$$

$$15. \cot\beta + \tan\beta = \sec\beta \csc\beta$$

$$16. \sin^2 \alpha + \tan^2 \alpha + \cos^2 \alpha = \sec^2 \alpha$$

$$17. \frac{\sec w}{\csc w} + \frac{\sin w}{\cos w} = 2 \tan w$$

$$18. 1 + \frac{\sin^2 x}{1 + \cos^2 x} = \frac{2}{1 + \cos^2 x}$$