

#10 Day 2 Verify Trig Identities

Name _____

Verify Each.

1. $\tan x \csc x = \sec x$

$$\frac{\sin x}{\cos x} \cdot \frac{1}{\sin x} =$$

$$\frac{1}{\cos x} =$$

$$\sec x$$

2. $\cot^2 x - \csc^2 x = -1$

3. $\csc x(1 - \cos^2 x) = \sin x$

$$\frac{1}{\sin x} \cdot \sin^2 x =$$

$$\sin x =$$

4. $\sin \theta - \sin \theta \cos^2 \theta = \sin^3 \theta$

5. $\cot^2 x \csc^2 x - \cot^2 x = \cot^4 x$

$$\cot^2 x (\csc^2 x - 1) =$$

$$(\cot^2 x) (\cot^2 x) =$$

$$\cot^4 x =$$

6. $\frac{\sec \theta}{\sin \theta} - \frac{\sin \theta}{\cos \theta} = \cot \theta$

$$\frac{\sin \theta \csc \theta}{\sin \theta \cos \theta} - \frac{\sin \theta \csc \theta}{\sin \theta \cos \theta}$$

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

$$\frac{\cos \theta}{1 + \sin \theta} + \frac{\sin \theta}{\cos \theta}$$

$$\frac{\cos^2 \theta + \sin \theta + \sin^2 \theta}{(\cos \theta)(1 + \sin \theta)}$$

$$\frac{1 + \sin \theta}{(\cos \theta)(1 + \sin \theta)}$$

$$8. \frac{1}{1 - \tan^2 x} + \frac{1}{1 - \cot^2 x} = 1$$

$$9. \tan^4 x + 2 \tan^2 x + 1 = \sec^4 x$$

$$\begin{aligned} (\tan^2 x + 1)(\tan^2 x + 1) &= \\ (\sec^2 x)(\sec^2 x) &= \\ \sec^4 x &= \end{aligned}$$

$$10. \cos^4 x - 2 \cos^2 x + 1 = \sin^4 x$$

$$11. \sin^4 x - \cos^4 x = \sin^2 x - \cos^2 x$$

$$\begin{aligned} (\sin^2 x + \cos^2 x)(\sin^2 x - \cos^2 x) &= \\ 1(\sin^2 x - \cos^2 x) &= \\ \sin^2 x - \cos^2 x & \end{aligned}$$

$$12. \sec^4 x - \tan^4 x = \sec^2 x + \tan^2 x$$

$$\begin{aligned} (\sec^2 x + \tan^2 x)(\sec^2 x - \tan^2 x) &= \\ (1 + \tan^2 x + \tan^2 x)(1 + \tan^2 x - \tan^2 x) &= \\ (1 + 2 \tan^2 x) \cdot 1 &= \end{aligned}$$

Compute the exact value in degrees WITHOUT using a calculator.

$$9. \cos^{-1}\left(\frac{\sqrt{2}}{2}\right) = 45^\circ$$

$$10. \arcsin\left(-\frac{\sqrt{3}}{2}\right)$$

$$11. \cos^{-1} 0 = 90^\circ$$

$$12. \sin(\cos^{-1}(-1))$$

$$13. \cos\left(\arcsin -\frac{\sqrt{3}}{2}\right) = \frac{1}{2}$$

$$14. \arccos\left(\sin \frac{4\pi}{3}\right)$$