

PC Unit 7L1 Practice 1 VERIFYING: Verify the following Trigonometric Identities

1) $\cos x + \sin x \tan x = \sec x$

$$\cos x + \sin x \cdot \frac{\sin x}{\cos x}$$

$$\cos x + \frac{\sin^2 x}{\cos x}$$

$$\frac{\cos^2 x + \sin^2 x}{\cos x}$$

$$\frac{1}{\cos x} = \sec x \quad \checkmark$$

3) $\frac{1}{\tan \beta} + \tan \beta = \frac{\sec^2 \beta}{\tan \beta}$

$$\frac{1 + \tan^2 \beta}{\tan \beta}$$

$$= \frac{\sec^2 \beta}{\tan \beta} \quad \checkmark$$

5) $\sec x + \tan x = \frac{\cos x}{1 - \sin x} \cdot \left(\frac{1 + \sin x}{1 - \sin x} \right)$

$$\frac{\cos x + \cos x \sin x}{1 - \sin^2 x}$$

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

$$\sec x + \tan x = \frac{1 + \sin x}{\cos x} \quad \checkmark$$

2) $\frac{\csc x - \sin x}{\sin x \csc x} = \csc x - \sin x$

$$\frac{\frac{1}{\sin} - \frac{\sin}{1}}{\sin \cdot \frac{1}{\sin}}$$

$$\frac{1 - \sin^2}{\sin}$$

$$= \frac{1 - \sin^2}{\sin}$$

$$\frac{1 - \sin^2 x}{\sin x} = \csc x - \sin x \quad \checkmark$$

4) $\frac{(1 + \sin \theta)}{(1 + \sin \theta)} \cdot \frac{1 + \sin \theta}{\cos \theta} + \frac{\cos \theta}{1 + \sin \theta} = 2 \sec \theta$

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

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

$$\frac{2(1 + \sin \theta)}{(1 + \sin \theta) \cos \theta} = 2 \sec \theta \quad \checkmark$$

6) $\frac{\cos^2 x - \sin^2 x}{1 - \tan^2 x} = \cos^2 x$

$$\frac{(\cos x + \sin x)(\cos x - \sin x)}{(1 + \tan x)(1 - \tan x)}$$

$$= \frac{\left(\frac{\cos x + \sin x}{\cos x} \right) \left(\frac{\cos x - \sin x}{\cos x} \right)}{\left(\frac{\cos x + \sin x}{\cos x} \right) \left(\frac{\cos x - \sin x}{\cos x} \right)} = \frac{\cos^2 x}{\cos^2 x} = 1 \quad \checkmark$$

$$\frac{\sin \alpha}{\cos \alpha + 1} + \frac{\cos \alpha - 1}{\sin \alpha} = 0 \frac{\cos \alpha + 1}{\cos \alpha + 1}$$

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

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

0 ✓

$$9) \frac{(1+\sin x) \cos x}{(1+\sin x)(1-\sin x)} = \sec x + \tan x$$

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

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

$$\frac{1+\sin x}{\cos x} = \sec x + \tan x$$

$$11) \frac{\cot^2 \alpha}{1 + \csc \alpha} = \csc \alpha - 1$$

$$\frac{\csc^2 \theta - 1}{1 + \csc \theta}$$

$$1 + \csc \theta$$

$$\frac{(\csc \theta + 1)(\csc \theta - 1)}{(1 + \csc \theta)}$$

$$(1 + \csc \theta)$$

$$8) \frac{\sin^2 \theta + \cos^2 \theta + \cot^2 \theta}{1 + \tan^2 \theta} = \cot^2 \theta$$

$$\frac{1 + \cot^2 \theta}{1 + \tan^2 \theta}$$

$$\frac{\csc^2 \theta}{\sec^2 \theta}$$

$$\frac{1}{\sin^2 \theta} \div \frac{1}{\cos^2 \theta}$$

$$\frac{\cos^2 \theta}{\sin^2 \theta} = \cot^2 \theta$$

$$10) \frac{\sec^2 \theta - 1}{\sec^2 \theta} = \sin^2 \theta$$

$$\frac{\tan^2 \theta}{\sec^2 \theta}$$

$$\frac{\sin^2 \theta}{\cos^2 \theta} \div \frac{1}{\cos^2 \theta}$$

$$\sin^2 \theta \checkmark$$

$$12) \cos^2 \beta - \sin^2 \beta = 1 - 2\sin^2 \beta$$

Write to create
1 trig fn

$$1 - \sin^2 \beta - \sin^2 \beta$$

$$1 - 2\sin^2 \beta \checkmark$$

$$13) \frac{\tan \theta \cot \theta}{\cos \theta} = \sec \theta$$

$$\frac{\tan \theta \cdot \frac{1}{\tan \theta}}{\cos \theta}$$

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

$$\sec \theta$$

$$15) (\tan^2 x + 1)(\cos^2 x - 1) = -\tan^2 x$$

$$(\sec^2 x)(-\sin^2 x)$$

$$\left(\frac{1}{\cos^2 x}\right)\left(\frac{-\sin^2 x}{\cos^2 x}\right)$$

$$-\tan^2 x \quad \checkmark$$

$$14) \left(\frac{1}{1-\sin x}\right) + \left(\frac{1}{1+\sin x}\right) = 2\sec^2 x$$

$$\frac{1+\sin x + 1-\sin x}{(1-\sin x)(1+\sin x)}$$

$$\frac{2}{1-\sin^2 x}$$

$$\frac{2}{\cos^2 x}$$

$$2\sec^2 x \quad \checkmark$$

Verifying Trigonometric Identities

Verify the following trigonometric identities.

1. $\cos x + \sin x \tan x = \sec x$

2. $\frac{\csc x - \sin x}{\sin x \csc x} = \csc x - \sin x$

3. $\frac{1}{\tan \beta} + \tan \beta = \frac{\sec^2 \beta}{\tan \beta}$

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

5. $\sec y + \tan y = \frac{\cos y}{1 - \sin y}$

6. $\frac{\cos^2 x - \sin^2 x}{1 - \tan^2 x} = \cos^2 x$

7. $\frac{\sin x}{\cos x + 1} + \frac{\cos x - 1}{\sin x} = 0$

8. $\frac{\sin^2 \theta + \cos^2 \theta + \cot^2 \theta}{1 + \tan^2 \theta} = \cot^2 \theta$

already
done
check