

Warm - Up

Simplify each expression.

1.) $\frac{\cot x \csc x}{\cos x}$

2.) $\cos x \tan x$

Chapter 7

Learning Target 1

I can verify basic trig identities.

TRIG IDENTITIES

Quotient Identities

$$\tan \theta = \frac{\sin \theta}{\cos \theta}$$

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

Reciprocal Identities

$$\sin \theta = \frac{1}{\csc \theta}$$

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

$$\tan \theta = \frac{1}{\cot \theta}$$

$$\csc \theta = \frac{1}{\sin \theta}$$

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

$$\cot \theta = \frac{1}{\tan \theta}$$

Pythagorean Identities



$$\sin^2 \theta + \cos^2 \theta = 1$$



$$1 + \tan^2 \theta = \sec^2 \theta$$

$$1 + \cot^2 \theta = \csc^2 \theta$$



Verifying Trig Identities



An identity is an equation that is always true no matter what values is used for the variable.

(excluding values that give an undefined value.)

$$2x + 3 = 2x + 3$$

$$x = x$$

$$\sin^2 x + \cos^2 x = 1$$

2) Verify.

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

\perp
 $\sec x$
 $\cos x = \cos x \checkmark$

3) Verify.

$$\cos x \tan x \csc x = 1$$

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

4) Verify.

$$\cancel{\csc x} = \frac{\cot x}{\cos x}$$

$$\frac{\cot x}{1} \cdot \frac{1}{\cos x}$$

$$\frac{\cancel{\cos x}}{\sin x} \cdot \frac{1}{\cancel{\cos x}} \rightarrow \frac{1}{\sin x}$$

$$\rightarrow \boxed{\csc x}$$

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

$$\cos^2 x + \sin^2 x = 1$$

$$\boxed{1=1}$$

$$2. \left(\sec^2 \theta - \tan^2 \theta \right) + \cot^2 \theta = \csc^2 \theta$$

$$\left(1 + \cot^2 \theta \right) = \csc^2 \theta$$

$$\boxed{\csc^2 \theta = \csc^2 \theta}$$