

10.3 Quiz Review
Algebra 2 with Trigonometry

Use trigonometric identities to simplify the expressions. Show all the steps.

1. $\tan x \cos x$

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

$$\sin x$$

2. $\frac{\cos \theta \tan \theta}{\sin \theta}$

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

~~$$\frac{\cos \theta}{\sin \theta} \cdot \frac{\sin \theta}{\cos \theta}$$~~

$$\frac{\cos \theta}{\sin \theta} \cdot \frac{\sin \theta}{\cos \theta}$$

$$1$$

3. $\tan x \cot x$

$$\tan x \cdot \frac{1}{\tan x}$$

$$1$$

4. $\sin x \cot x \sec x$

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

$$1$$

5. $\cos \theta \csc \theta \tan \theta$

~~$$\cos \theta \cdot \frac{1}{\sin \theta} \cdot \frac{\sin \theta}{\cos \theta}$$~~

$$1$$

6. $\sin^2(x) - \sin^2(x) \cos^2(x)$

$$\sin^2 x (1 - \cos^2 x)$$

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

$$\sin^4 x$$

Verify the following identities by only manipulating the left side of the equation.
Show all the steps.

$$7. (\tan^2 x + 1)(\cos^2 x - 1) = -\tan^2 x$$

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

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

$$\frac{-\sin^2 x}{\cos^2 x} = \boxed{-\tan^2 x} \checkmark$$

$$8. \csc^2 x(1 - \sin^2 x) = \cot^2 x$$

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

$$\frac{\cos^2 x}{\sin^2 x} = \boxed{\cot^2 x}$$

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

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

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

$$10. \sec x + \tan x = \frac{\cos x}{1 - \sin x}$$

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

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

$$= \frac{\cos x}{1 - \sin x} \checkmark$$