College Algebra

Name: Key

7.5 Practice

Date: _____ Period: _____

Verify the following trigonometric identities.

1.) $\dfrac{\sin x}{1+\cos x} = \dfrac{1-\cos x}{\sin x}$

$\dfrac{\sin x(1-\cos x)}{1-\cos^2 x} =$

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

$\dfrac{1-\cos x}{\sin x} = \dfrac{1-\cos x}{\sin x}$

2.) $\csc x + \cot x = \dfrac{\sin x}{1-\cos x}$

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

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

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

$\csc x + \cot x = \dfrac{1}{\sin x} + \dfrac{\cos x}{\sin x}$

$\csc x + \cot x = \csc x + \cot x$

3.) $\dfrac{1+\cos x}{\tan^2 x} = \dfrac{\cos x}{\sec x - 1}$

$= \dfrac{\cos x(\sec x+1)}{\sec^2 x - 1}$

$\dfrac{\cos x(\sec x+1)}{\tan^2 x}$

$\dfrac{\cos x \cdot \sec x + \cos x}{\tan^2 x}$

$\dfrac{\cos x \cdot \frac{1}{\cos x} + \cos x}{\tan^2 x}$

$\dfrac{1+\cos x}{\tan^2 x} = \dfrac{1+\cos x}{\tan^2 x}$

4.) $\dfrac{\tan x}{1+\cos x} = \dfrac{1-\cos x}{\sin x \cos x}$

$\dfrac{\tan x(1-\cos x)}{1-\cos^2 x} =$

$\dfrac{\tan x(1-\cos x)}{\sin^2 x}$

$\dfrac{\tan x}{\sin^2 x} \cdot \dfrac{1-\cos x}{1}$

$\dfrac{\sin x}{\cos x} \cdot \dfrac{1}{\sin^2 x} \cdot \dfrac{1-\cos x}{1}$

$\dfrac{1}{\cos x \sin x} \cdot \dfrac{1-\cos x}{1}$

$\dfrac{1-\cos x}{\sin x \cos x} = \dfrac{1-\cos x}{\sin x \cos x}$

REVIEW: Verify the trigonometric identities.

5.) $\csc x - \sin x = \cos x \cot x$

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

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

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

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

$\csc x - \sin x = \csc x - \sin x$

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

$1 + \tan^2 x =$

$\sec^2 x = \frac{1}{\cos^2 x}$

$\sec^2 x = \sec^2 x$

7.) $\frac{(\sin x + \cos x)^2}{1 + 2\tan x \cos^2 x} - 1 = 0$

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

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

$1 - 1 =$

$0 = 0$

8.) $\frac{5\cos^2 x + 3\cos x - 2}{\sin^2 x} = \frac{5\cos x - 2}{1 - \cos x}$

$\frac{(5\cos x - 2)(\cos x + 1)}{1 - \cos^2 x} =$

$\frac{(5\cos x - 2)(\cos x + 1)}{(1 - \cos x)(1 + \cos x)}$

$\frac{5\cos x - 2}{1 - \cos x} = \frac{5\cos x - 2}{1 - \cos x}$