College Algebra **Name:** Key

7.2 Practice **Date:** _____ **Period:** _____

* answers may vary *

Verify the following identities.

1.) $(1+\cos\theta)(1-\cos\theta)=\sin^2\theta$

$1-\cos^2 x =$

$\sin^2 x = \sin^2 x$

2.) $\cos x(\csc x+\tan x)=\cot x+\sin x$

$\cos x \csc x + \cos x \tan x =$

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

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

$\cot x + \sin x = \cot x + \sin x$

3.) $(1-\tan\theta)^2=\sec^2\theta-2\tan\theta$

$1-2\tan x - \tan^2 x =$

$\sec^2 x - 2\tan x = \sec^2 x - 2\tan x$

4.) $\tan\theta+1=\sin\theta(\sec\theta+\csc\theta)$

$= \sin x \cdot \sec x + \sin x \cdot \csc x$

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

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

$\tan x + 1 = \tan x + 1$

5.) $\sin^3 x + \cos^3 x = (\cos x + \sin x)(1 - \cos x \sin x)$

$= \cos x - \cos^2 x \cdot \sin x + \sin x - \cos x \cdot \sin^2 x$

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

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

$\cos x \boxed{-\sin x} + \sin^3 x \boxed{+\sin x} - \cos x + \cos^3 x$

$\sin^3 x + \cos^3 x = \sin^3 x + \cos^3 x$

6.) $\csc^2 \theta = \sin^2 \theta(1 + \cot \theta) + \cos^2 \theta(1 - \tan \theta) + \cot^2 \theta$

* $\cos x \sin x = \sin x \cos x$

$= \sin^2 x + \sin^2 x \cdot \cot x + \cos^2 x - \cos^2 x \cdot \tan x + \cot^2 x$

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

$= 1 \boxed{+ \sin x \cos x - \cos x \sin x} + \cot^2 x$

$\sin x \cos x - \sin x \cos x$

$= 1 + \cot^2 x$

$\csc^2 x = \csc^2 x$