Math 125 PreCalculus
Fall 2014, 9.1

TRIG IDENTITIES PRACTICE

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Name_____

Please practice on the following problems to be well prepared for Quizzes and Exams. Good luck and this worksheet is optional!!!

Simplify the trigonometric expression.

1) $\dfrac{(\tan\theta + 1)(\tan\theta + 1) - \sec^2\theta}{\tan\theta}$ 1) _____

2) $\dfrac{5\cos^2\theta + 6\cos\theta + 1}{\cos^2\theta - 1}$ 2) _____

Simplify the expression.

3) $(1 + \cot\theta)(1 - \cot\theta) - \csc^2\theta$ 3) _____

Establish the identity.

4) $(1 + \tan^2 u)(1 - \sin^2 u) = 1$ 4) _____

5) $\tan u(\csc u - \sin u) = \cos u$ 5) _____

6) $(\sin x)(\tan x \cos x - \cot x \cos x) = 1 - 2\cos^2 x$ 6) _____

7) $1 - \dfrac{\cos^2 u}{1 - \sin u} = -\sin u$ 7) _____

8) $\dfrac{1 - \sin t}{\cos t} = \dfrac{\cos t}{1 + \sin t}$ 8) _____

9) $\sec^4 x - \tan^4 x = \sec^2 x + \tan^2 x$ 9) _____

10) $\dfrac{\sin x}{1 - \cos x} + \dfrac{\sin x}{1 + \cos x} = 2\csc x$ 10) _____

1) 2

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

3) $-2\cot^2\theta$

4) $(1 + \tan^2 u)(1 - \sin^2 u) = \sec^2 u \cdot \cos^2 u = \frac{1}{\cos^2 u} \cdot \cos^2 u = 1$

5) $\tan u(\csc u - \sin u) = \tan u \cdot \csc u - \tan u \cdot \sin u = \frac{\sin u}{\cos u} \cdot \frac{1}{\sin u} - \frac{\sin u}{\cos u} \cdot \sin u = \frac{1}{\cos u} - \frac{\sin^2 u}{\cos u} = \frac{1 - \sin^2 u}{\cos u} = \frac{\cos^2 u}{\cos u} = \cos u$

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

7) $1 - \frac{\cos^2 u}{1 - \sin u} = 1 - \frac{1 - \sin^2 u}{1 - \sin u} = 1 - \frac{(1 - \sin u)(1 + \sin u)}{1 - \sin u} = 1 - (1 + \sin u) = -\sin u$

8) $\frac{1 - \sin t}{\cos t} = \left(\frac{1 + \sin t}{1 + \sin t}\right)\left(\frac{1 - \sin t}{\cos t}\right) = \frac{\cos^2 t}{\cos t\,(1 + \sin t)} = \frac{\cos t}{1 + \sin t}.$

9) $\sec^4 x - \tan^4 x = (\sec^2 x + \tan^2 x)(\sec^2 x - \tan^2 x) = (\sec^2 x + \tan^2 x)(1) = \sec^2 x + \tan^2 x.$

10) $\frac{\sin x}{1 - \cos x} + \frac{\sin x}{1 + \cos x} = \frac{\sin x[(1 + \cos x) + (1 - \cos x)]}{(1 - \cos x)(1 + \cos x)} = \frac{2\sin x}{1 - \cos^2 x} = \frac{2\sin x}{\sin^2 x} = 2\csc x.$