

MAT 145 Quiz/Worksheet #5 - Trigonometric Identities

Name.....

Name.....

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Please show your work clearly and neatly. NO work – NO credit! Your group size may have AT MOST 4 people. Please show your work clearly and neatly on separate paper(s). They will NOT be accepted unless they are **stapled** to this cover sheet.

Verify the following Trigonometric Identities:

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

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

3. $\frac{1}{1 - \sin x} + \frac{1}{1 + \sin x} = 2 \sec^2 x$

~~4.~~ $\sin^2 \alpha - \sin^2 \beta = \cos^2 \beta - \cos^2 \alpha.$

5. $\cos^2 \theta (1 + \tan^2 \theta) = 1$

6. $\tan \theta + \cot \theta = \sec \theta \csc \theta$

7. $\sin^4 \theta - \cos^4 \theta = 2 \sin^2 \theta - 1$

8. $\sec^4 \theta - \sec^2 \theta = \tan^4 \theta + \tan^2 \theta$

9. $3 \sin^2 \theta + 4 \cos^2 \theta = 3 + \cos^2 \theta$

10. $\frac{\tan x - \cot x}{\tan x + \cot x} = \sin^2 x - \cos^2 x$

11. $\frac{\sin x \cos x}{\cos^2 x - \sin^2 x} = \frac{\tan x}{1 - \tan^2 x}$

12. $\frac{1 + \tan x}{1 - \tan x} = \frac{\cot x + 1}{\cot x - 1}$

13. $\frac{1 - \sin x}{1 + \sin x} = (\sec x - \tan x)^2$

14. $\frac{1 - \cos x}{1 + \cos x} = (\csc x - \cot x)^2$

15. $\frac{1 + \sin x}{1 - \sin x} - \frac{1 - \sin x}{1 + \sin x} = 4 \tan x \sec x$

~~16.~~ $\frac{\tan \alpha + \tan \beta}{\cot \alpha + \cot \beta} = \tan \alpha \tan \beta$