Kerry Ojakian's MTH 30 Class Class Assignment #23

- 1. Use the fundamental identities of trigonometric functions to write the following expressions using only sine and cosine and simplify them as much as possible.
 - (a) $\sin x \cos x \sec x$

 $\tan x \sin x + \sec x \cos^2 x$

- 2. Use the fundamental identities of trigonometric functions to write the following expressions using only sine and cosine and simplify them as much as possible.
 - (a) $\csc x \cos x \cot x$

(b) $3\sin^3 x \csc x + 3\cos^2 x$

3. Use the fundamental identities of trigonometric functions to write

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

using only sine and cosine and simplify them as much as possible.

4. Use the fundamental identities of trigonometric functions to write

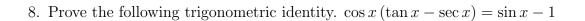
$$\frac{1+\tan^2 x}{\csc^2 x} + \sin^2 x + \frac{1}{\sec^2 x}$$

using only sine and cosine and simplify them as much as possible.

5. Show that $tan(x) \csc(x) \cos(x) = 1$.

6. Prove that $tan(\theta) + cot(\theta) = sec(\theta) \csc(\theta)$.

7. Prove that $\frac{\tan^2(\theta) + 2}{1 + \tan^2(\theta)} = 1 + \cos^2(\theta)$.



9. Prove the following trigonometric identity.
$$\sec^2 x (1 + \cos^2 x) = \tan^2 x$$

10. Prove the following trigonometric identity.
$$\sin x (\cot x + \csc x) = \cos x + 1$$

11. Prove the following trigonometric identity.
$$\cos^2 x(1 + \tan^2 x) = 1$$

12. Prove the following trigonometric identity. $\sin x \tan x = \sec x - \cos x$

13. Prove the following trigonometric identity. $\sec x - \cos x = \tan x \sin x$

14. Prove the following trigonometric identity. $\sec x \csc x = \tan x + \cot x$.

15. Prove the following trigonometric identity. $\frac{\cos x \sec x}{\cot x} = \tan x$