3. $\sec y \sin(90° - y)$

$\sec y(\cos y)$

$\frac{1}{\cos y} \cdot \frac{\cos y}{1} = 1$

Simplify the expression to either 1 or -1.

7. $\sin x \csc(-x)$

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

8. $\sec(-x) \cos(-x)$

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

9. $\cot(-x) \cot(90° - x)$

$-\frac{\cos x}{\sin x} \cdot \tan x$

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

10. $\cot(-x) \tan(-x)$

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

Precalculus A

5.2 Proving Trigonometric Identities

Day One

Homework: 5.2 Assignment #7

D. Paulson

General Strategies

1. **Begin with the more complicated expression and work toward the less complicated expression.**

2. **If no other move suggests itself, convert the entire expression to one involving sines and cosines.**

3. **Combine fractions by combining them over a common denominator.**

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Example:

Prove: tanx + cotx = secx cscx.

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

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

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

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

$$\sec x \csc x$$

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Example:

Prove: $\sin x(\cot x + \cos x \tan x) = \cos x + \sin^2 x$

$\sin x \cot x + \sin x \cos x \tan x$

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

$\cos x + \sin^2 x$

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

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Example (#5 on homework):

Prove: $\tan x + \sec x = \frac{\cos x}{1 - \sin x}$

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

$\frac{\sin x + 1}{\cos x} \cdot \frac{(1 - \sin x)}{(1 - \sin x)}$

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

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

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

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