**Section 5.1** (Verifying Trigonometric Identities)

How many of you enjoy puzzles? Verifying trigonometric identities is similar to solving puzzles.

Using fundamental trigonometric identities learned in the previous chapter can help in these verification problems.

Reciprocal Quotient Pythagorean Even-Odd

   

To verify an identity, show that one side of the identity is identical to the other. No one technique can be used to verify all identities. It often helps to rewrite one side (or both) so that it contains only sin and cos, though.

Example: Verify the identity csc x tan x = sec x

When verifying identities by manipulating one side, continue to look at the other side to remember the desired result

Example: Verify the identity cos x cot x + sin x = csc x

Sometimes you can use factoring to help simplify a trigonometric expression.

Example: Verify the following identities

 sin x – sin x cos2 x = sin3 x $\frac{1+\cos(θ)}{sin θ}$ = csc θ + cot θ

Also remember techniques of working with rational expressions to combine / eliminate fractions with the LCD

Example: Verify the following identities

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

Sometimes it can be helpful to work each side of the identity separately and then show they are equal

Examples: Verify the following identities

 $\frac{sec x+csc⁡(-x)}{\sec(x)csc x}$ = sin x – cos x $\frac{1}{1+sin θ}$ + $\frac{1}{1-sin θ}$ = 2 + 2 tan2 θ

See page 593 for general guidelines and tips on verifying trigonometric identities and do ONLINE HW

