

Unit #3: Trigonometry

Topic: Proving Trigonometric Identities

Objective: SWBAT prove that a trigonometric identity is true.

Warm Up #6:

If $x = \frac{5\pi}{6}$, show that $\sec^2 x \tan^2 x + \sec^2 x = \sec^4 x$.

Proving Trigonometric Identities:

Remember an identity is an equation that is true for all defined values of a variable.

We are going to use the identities that we have already established to "prove" or establish other identities.

Guidelines for Proving/Verifying Identities:

1. Start with the _____ side of the equation.
2. _____ an expression, add _____, _____ a binomial, or create a _____ denominator, if possible.
3. Use the _____, whenever possible.
4. Convert all terms to _____ and _____.
5. Always try _____.

Example #1: Prove $\cot^2 x - \cos^2 x = \cot^2 x \cos^2 x$

Example #2: Prove $\frac{\csc x + \sec x}{\sin x + \cos x} = \cot x + \tan x$

Problem Set #6: Prove each of the following trig identities.

1) $\sec^2 x \cot x - \cot x = \tan x$

2) $\sin x \csc x - \cos^2 x = \sin^2 x$

$$3) (\tan^2 y + 1)(\cos^2 y - 1) = -\tan^2 y$$

$$4) \cos x(\tan^2 x + 1) = \sec x$$

$$5) \sin^3 \theta + \sin \theta \cos^2 \theta = \sin \theta$$

$$6) \sin^4 x - \cos^4 x = 2\sin^2 x - 1$$

$$7) \frac{\sec^2 x - 1}{\sec^2 x} = \sin^2 x$$

$$8) \frac{\sin t}{1 + \cos t} + \frac{1 + \cos t}{\sin t} = 2\csc t$$

$$9) \frac{2\cos^2 y - \sin^2 y + 1}{\cos y} = 3\cos y$$

$$10) (\sec x - \tan x)(\csc x + 1) = \cot x$$

$$11) \frac{\csc x + \cot x}{\tan x + \sin x} = \cot x \csc x$$

$$12) \frac{1}{1 - \sec x} + \frac{1}{1 + \sec x} = -2\cot^2 x$$

 Homework

Assignment(s): Finish packet #1-12