

Section 5.2 Verifying Trigonometric Identities

Objective: In this lesson you learned how to verify trigonometric identities.

Course Number

Instructor

Date

I. Introduction (Page 380)

The key to verifying identities and solving equations is

the ability to use the fundamental identities and the rules of algebra to rewrite trigonometric expressions.

What you should learn

How to plan a strategy for verifying trigonometric identities

An identity is an equation that is true for all real values in the domain of the variable.

II. Verifying Trigonometric Identities (Pages 380–384)

Complete the following list of guidelines for verifying trigonometric identities:

What you should learn

How to verify trigonometric identities

- 1) **Work with one side of the equation at a time. It is often better to work with the more complicated side first.**
- 2) **Look for opportunities to factor an expression, add fractions, square a binomial, or create a monomial denominator.**
- 3) **Look for opportunities to use the fundamental identities. Note which functions are in the final expression you want. Sines and cosines pair up well, as do secants and tangents, and cosecants and cotangents.**
- 4) **If the preceding guidelines do not help, try converting all terms to sines and cosines.**
- 5) **Always try something. Even paths that lead to dead ends provide insights.**

Example 1: Describe a strategy for verifying the identity $\sin \theta \tan \theta + \cos \theta = \sec \theta$. Then verify the identity.

Begin by converting all terms to sines and cosines.

Example 2: Describe a strategy for verifying the identity $\sin^2 x(\csc x - 1)(\csc x + 1) = 1 - \sin^2 x$. Then verify the identity.

Because the left side is more complicated, start with it. Begin by multiplying $(\csc x - 1)$ by $(\csc x + 1)$, and then search for a fundamental identity that can be used to replace the result.

Example 3: Verify the identity $\cot^5 \alpha = \cot^3 \alpha \csc^2 \alpha - \cot^3 \alpha$.

Additional notes

Homework Assignment

Page(s)

Exercises