§5.2 Verifying Trigonometric Identities

- an identity is an equation which is true for all values for which the equation is defined
- to verify an identity, generally work with one side of the equation and show that it equals the other side
- some suggestions to consider when verifying identities:

1.) simplify the more complex side
2.) perform algebraic operations including squaring, factoring, adding or subtracting fractions, multiplying the numerator and denominator by a nonzero factor
3.) rewrite in terms of sine and cosine
4.) rewrite in terms of a single trigonometric function
5.) use other identities (reciprocal identities, ratio identities, pythagorean identities)

Examples Verify each identity.

a.) $\frac{\sec^2\theta - 1}{\sec^2\theta} = \sin^2\theta$

b.) $\frac{1}{1-\sin\alpha} + \frac{1}{1+\sin\alpha} = 2\sec^2\theta$

c.) $(\tan^2 x + 1)(\cos^2 x - 1) = -\tan^2 x$

d.) $\tan x + \cot x = \sec x \csc x$

e.) $\sec y + \tan y = \frac{\cos y}{1-\sin y}$

f.) $\frac{\cot^2\theta}{1+\csc\theta} = \frac{1-\sin\theta}{\sin\theta}$

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