Math 1613 - Trigonometry

Quiz #8 - 2009.10.08

Solutions

Verify the following trigonometric identity:

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

We will start with the left side, and end up with the right:

$$\begin{aligned}
(1 - \cos^2(x))(1 + \cos^2(x)) &= \sin^2(x)(1 + \cos^2(x)) \\
&= \sin^2(x) + \sin^2(x)\cos^2(x) \\
&= \sin^2(x) + \sin^2(x)(1 - \sin^2(x)) \\
&= \sin^2(x) + \sin^2(x) - \sin^4(x) \\
&= 2\sin^2(x) - \sin^4(x)
\end{aligned}$$