

Math 1613 - Trigonometry
Quiz #9 - 2010.11.09
Solutions

Verify that the following trigonometric equation is an identity.

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