1. Verify the identity \((\cot^2(x) + 1)(1 - \cos^2(x)) = 1\).
   First, check graphically: graph \(Y_1 = ((1/TAN(X))^2 + 1)(1 - (COS(X))^2)\).
   Is \(Y_1 = 1\)? _______ (Trace) Now simplify the left side:
   \((\cot^2(x) + 1)(1 - \cos^2(x)) =

2. Verify the identity \(\frac{\sec^2(\theta) - 1}{\tan(\theta) \sin(\theta) + \cos(\theta)} \cot(\theta) = \sin(\theta)\).
   Simplify the left side:
   \(\frac{\sec^2(\theta) - 1}{\tan(\theta) \sin(\theta) + \cos(\theta)} \cot(\theta) =

3. Verify the identity \(\frac{1}{1+\sin(t)} = \sec(t) - \tan(t)\) sec(t) (for \(t \neq \frac{\pi}{2} + k\pi\)).
   Simplify left side:
   \(\frac{1}{1+\sin(t)} =

   Simplify right side:
   \((\sec(t) - \tan(t)) \sec(t) =

Once the two sides have been reduced to the same expression, the identity is verified.
Why the restriction on \(t\)? Graph \(Y_1 = 1/(1 + SIN(X))\) and \(Y_2 = (((COS(X))^{-1} - TAN(X)))/COS(X)\). What happens at \(x = \frac{\pi}{2}\) and \(x = \frac{3\pi}{2}\)?