This is a diagnostic quiz, which does not contribute to your final score in any way. As usual, I do expect you to solve some (in fact all) of them. Please write down your first and last names. Good Luck!

1. (10 mins) Please use trigonometric substitution to compute the following integral.

\[ \int_{0}^{1} \frac{1}{\sqrt{1 + x^2}} \, dx. \]

(Hint: Try the \( x = \tan(u) \) substitution. And

\[ F(u) = \ln \left( \frac{1 + \sin u}{\cos u} \right) \]

is also a very useful function to keep in mind.)