Quiz **Name**

1. Define the function $g(x) = \tan^{-1} x$. Explain why $\tan^{-1}(0) = 0$ and $\tan^{-1}(1) = \frac{\pi}{4}$.

a. Use the fact that $\frac{d}{dx} \tan^{-1} x = \frac{1}{x^2+1}$ to compute $\displaystyle\int_0^1 \frac{1}{x^2+1}\, dx$.

b. Determine the concavity situation for the graph of $g(x) = \tan^{-1} x$.