

(19) Show that $x = 1 + \tan^{-1}(x)$ has a solution α . Find an interval $[a, b]$ containing α such that for every $x_0 \in [a, b]$, the iteration

$$x_{n+1} = 1 + \tan^{-1}(x_n) \quad n \geq 0$$

will converge to α . Calculate the first few iterates and estimate the rate of convergence.