HA 1, Date:31/03/2021

A .zip file containing the two codes, q1.f90 and q2.f90, needs to be submitted.

---

1. Consider the case of a finite well. If you remember, there are three regions to be considered and piecewise solutions are obtained. And taking boundary conditions into account, we obtain two transcedental equations, one for "even" solutions and the other for "odd" solutions. The equation for even solution is

$$\epsilon \; tan \; \epsilon = \sqrt{\rho^2 - \epsilon^2}.$$

   Solve this equation to find a root, i.e. ϵ, using Newton-Raphson method. Start with a value of 3.5 for ϵ. Use a value of 4.0 for ρ.

2. Solve the above problem using the Secant method. Use 3.2 and 3.4 as the starting values.