

equation is:

$$\frac{d^2 \phi}{dr^2} + \frac{1}{r} \frac{d\phi}{dr} + \lambda^2 \phi = 0$$

So, Solution is:

$$\phi(r) = A J_0(\lambda r) + B Y_0(\lambda r)$$

and Boundary condition is:

$$\omega(r_i, t) = 0$$

$$\omega(r_o, t) = 0$$

So, Main Problem is to find out
A and B.