(a) A composite pipe is constructed as shown in the figure. The inner pipe has a mean radius \( r \) and wall thickness \( t \), while the outer pipe has a mean radius \( 3r/2 \) and wall thickness \( t \). Both pipes are made of the same material (Young's modulus \( E \) and Poisson's ratio \( \nu \)). The ends of the pipe are built into an immovable foundation.

The space between the pipes is filled with an insulating material which is essentially incompressible and has a negligibly small shear modulus.

If this composite pipe is subjected to an internal pressure \( q \), calculate the stresses in the insulating material and in the pipes (at points away from the supports).

(b) A long continuous segment of the pipe of part (a) is suspended from the ceiling by rigid clamps which are placed periodically at a spacing \( L \). The pipe carries steam at a pressure \( q \). The composite pipe weighs \( w \) per unit length.

The maximum allowable stress in the piping material is \( \sigma_0 \) in tension and \( \tau_0 \) in shear. Calculate the maximum permissible spacing \( L \) between the supports for a given pressure \( q \).