

Name_____ Student number_____

Assignment 5 (4p)

A long rain gutter of cylindrical shape is filled with water (density ρ) and mounted with long cylindrical joints. Assuming that displacement and stress are independent in the z -coordinate, and weight of the gutter is negligible, write down the boundary value problem giving as its solution the stress resultants and displacement components according to Kirchhoff theory. Thickness t , radius R , and the material parameters E , ν are constants. Use the equilibrium and constitutive equations in the cylindrical (z, ϕ, n) coordinate system (\vec{e}_n points inwards).

