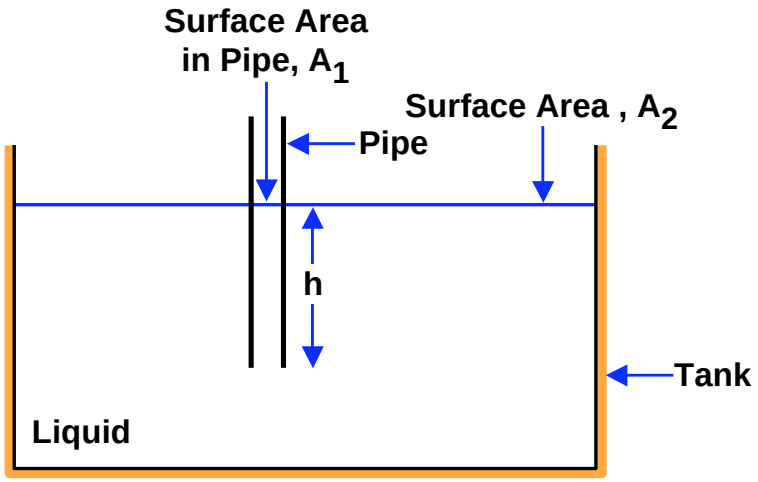
Problem 206B

A vertical pipe of internal cross-setional area, A_1, is submerged in a tank of water to a depth, h. The remaining water surface area in the tank is A_2 which is much larger than A_1. Both the water surface inside the pipe and that of the rest of the tank are open to the atmosphere.



Neglecting all viscous effects and all inertial effects except for that of the water inside the pipe (the inertial effects in the water outside the pipe will be small since $A_2 >> A_1$) find the natural period of oscillation of the water rising and falling in the pipe. The water is assumed incompressible. The answer should involve A_1, A_2, h and g.