Problem 5.33
This problem is from "Advanced Fluid Mechanics Problems" by A.H. Shapiro and A.A. Sonin
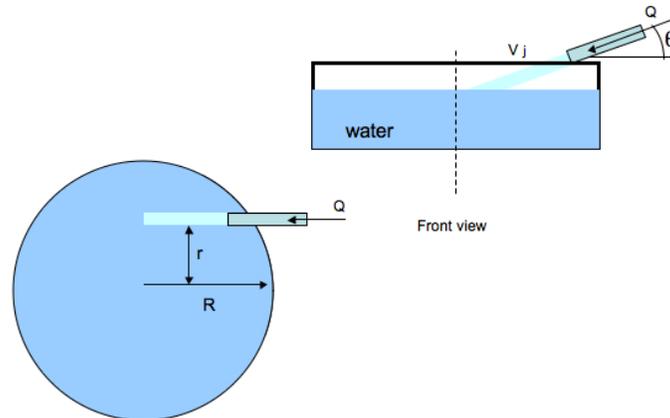
At $t = 0$, a circular tank of radius R contains water at rest, with a depth h. Between $0 < t < \tau$, a water hose is sprayed onto the surface of the water in the tank at a volume flow rate Q and an exit velocity V_j. The jet impacts tangentially on the water at a radius R_j, with an angle θ relative t the horizontal.

After the time τ, the hose is turned off. Eventually, because of friction within the water, all the water in tank will end up rotating like a solid body.

Derive an expression for the final angular rate of rotation Ω of the water, assuming shear forces between the water and the walls of the tank are negligible.

2.25 Advanced Fluid Mechanics
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