Homework H.4.R

Given: Particle P, having a mass of m, is able to slide on the smooth, horizontal top of a table. A flexible cable is attached to P, with the cable being fed through a hole in the table at O. A constant force F acts on the other end of the cable. The system is released with P being at a radial distance $R = R_1$ from O, and with P having a velocity perpendicular to OP with a speed of v_{P1} .

Find: Determine the numerical values for \dot{R} and $\dot{\phi}$ when P has moved to a position for which $R = R_2$.



Use the following parameters in your analysis: m = 2 kg, $R_1 = 1.5$ m, $R_2 = 0.5$ m, $v_{P1} = 5$ m/s and F = 236 N.