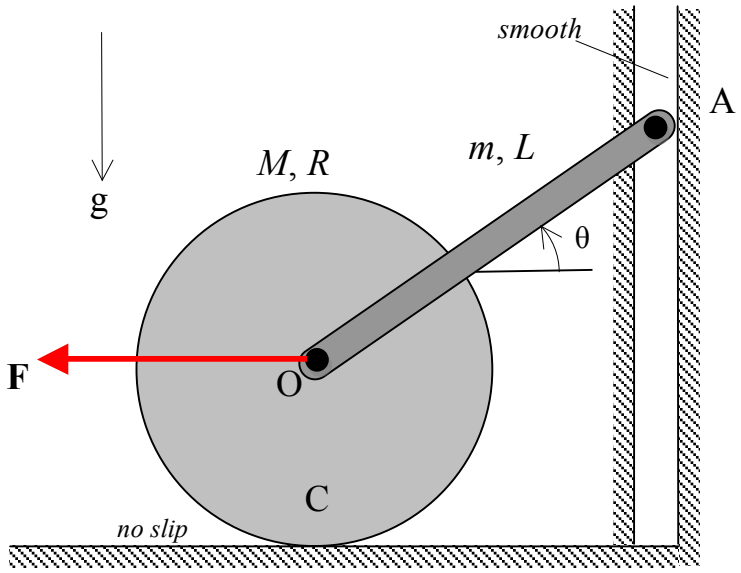
Homework H5.P

Given: A homogeneous disk (mass M and radius R) is attached to a homogeneous, thin rod OA (mass m) at its center O. A constant force F is applied at O and point A is confined so that it moves along a smooth, vertical slot. The disk rolls without slipping. If the system is released from rest with $\theta = \theta_1$.

Find: Determine the velocity of point A when $\theta = \theta_2$.



Use the following parameters in your analysis: $M = 12$ kg, $m = 6$ kg, $R = 1$ m, $L = 2.5$ m, $F = 80$ N, $\theta_1 = 53.13°$ and $\theta_2 = 0°$.