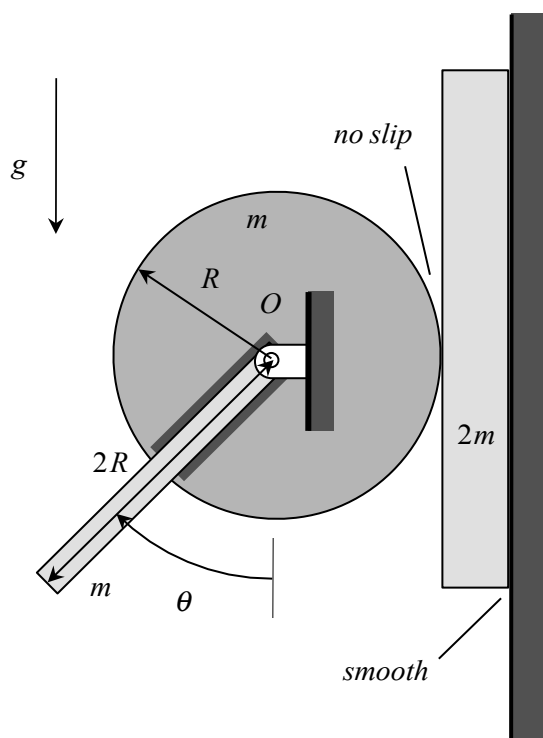


Homework H5.J

Given: A homogeneous disk of mass m and outer radius R is able to rotate about a frictionless bearing at its center O . A thin, homogeneous bar of mass m and length $2R$ is welded to the disk with the bar aligned with a radial direction on the disk and one end at O . A block of mass $2m$ is able to slide along a smooth, vertical wall, with the block being in no-slip contact with the outer surface of the disk, as shown in the figure. The system is released from rest with $\theta = 90^\circ$.

Find: Determine the angular velocity of the disk after the disk has rotated through an additional angle of 90° after release.



Use the following parameters in your analysis: $m = 5 \text{ kg}$ and $R = 0.1 \text{ m}$.