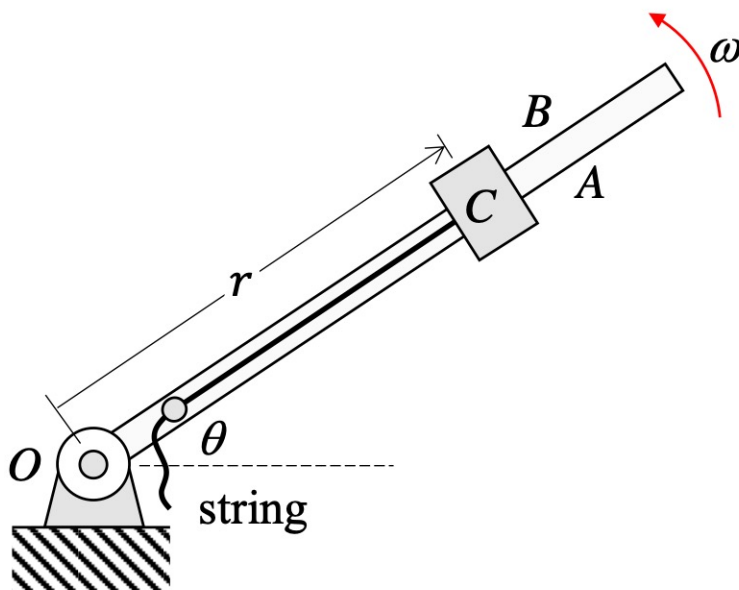


Homework H.4.A

Given: An arm rotates about a vertical axis passing through O at a rate of ω with this rotation changing at a rate of $\dot{\omega}$. Block C, having a mass of m , slides smoothly over the arm at a rate of \dot{r} with this sliding motion changing at a rate of \ddot{r} .

Find: At this instant, determine:

- The tension force in the cord;
- The normal force of the arm on block C;
- Which side of the arm (A or B) that the block makes contact.

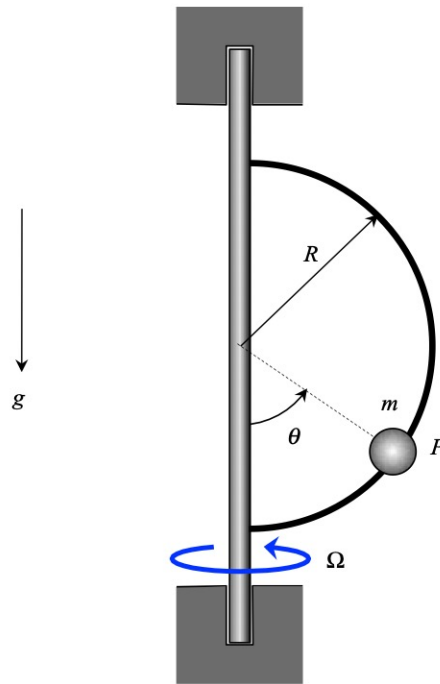


Use the following parameters in your analysis: $m = 10$ kg, $\omega = 5$ rad/s, $\dot{\omega} = 2$ rad/s², $r = 0.3$ m, $\dot{r} = -0.6$ m/s and $\ddot{r} = 0$ m/s².

Homework H.4.B

Given: A rigid semi-circular guide of radius R is attached to a vertical shaft, with the shaft rotating with a constant rate of Ω . Particle P (of mass m) is able to slide on the guide.

Find: If the guide is smooth, determine the angle θ at which the particle will not slide on the guide.



Please leave your answer in terms of, at most, m , R and Ω .