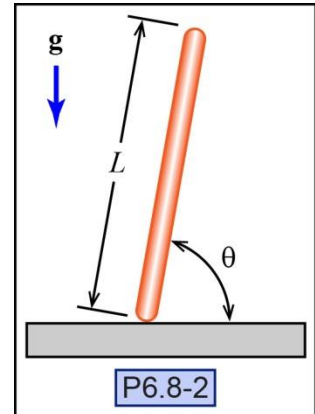**P6.8-2)** A uniform, rigid rod of mass m is placed on a frictionless surface. The rod is released from rest from the shown position at $t = 0$. Determine the rod's initial angular acceleration if $L = 1$ m, $\theta(0) = 80^o$ and $\omega(0) = 0$. Assume that the end of the rod stays in contact with the ground.

Given:

P6.8-2

Find:

Solution:

Free-body diagram

Kinematics

Determine the linear acceleration of the rod's center of mass.

Equation of motion

What point are you going to use as your reference?

$\mathbf{a}_G = $ _____

Angular acceleration

$\alpha = 9.37$ rad/s²