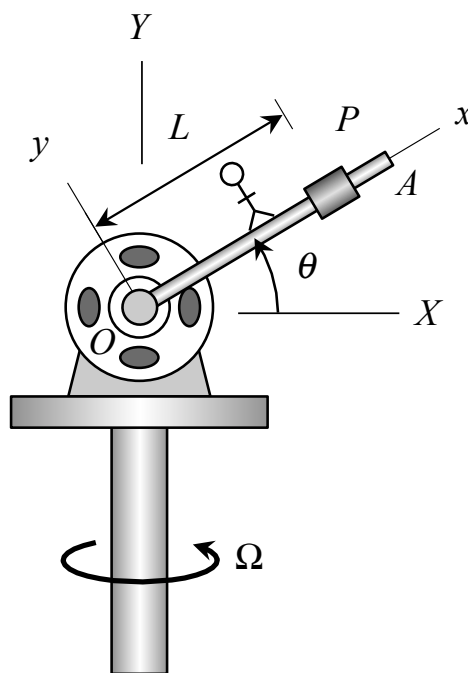**Homework H.3.J**

Given: A motor is mounted on a platform, with the platform attached to the top end of a shaft that is rotating about a fixed vertical axis at a constant rate of Ω. The motor is known to be rotating at a constant rate of $\dot{\theta}$. Arm OA is attached to the output shaft of the motor, with end O located on the rotation axis of the vertical shaft, as shown in the figure. A collar P is able to slide along arm OA, with the position of P being at a distance of L from O. A set of xyz-coordinate axes are attached to OA, as shown.

Find: For this problem,

(a) determine the angular velocity and angular acceleration of OA.

(b) determine the velocity and acceleration of slider P.

Write your answers as vectors in terms of their xyz-components.

HINT: Consider using an observer attached to OA, as shown.

Use the following parameters in your analysis: $\theta = 30°$, $\Omega = 4$ rad/s, $\dot{\theta} = 3$ rad/s, $L = 3$ ft and $\dot{L}$ = 8 ft/s.