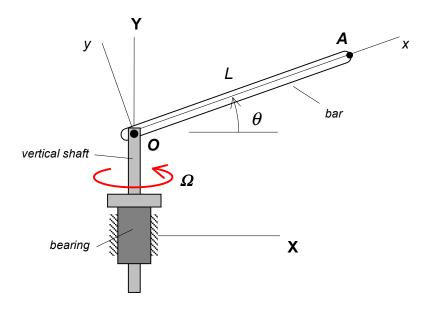
Homework H.3.E

Given: A shaft rotates about a fixed vertical axis at a constant rate of Ω , as shown below. A straight bar OA, having a length of L, is pinned to point O on the shaft, with O being on the rotation axis of the shaft. At the instant when $\theta = 0^{\circ}$, bar OA is being raised at a rate of $\dot{\theta}$ from the horizontal plane, with this rate changing at a rate of $\ddot{\theta}$. A set of xyz coordinate axes is attached to bar OA with its origin at O. A second set of coordinate axes, XYZ, are fixed to ground. At the instant when $\theta = 0^{\circ}$, the xyz and XYZ axes are aligned with each other.

Find: For the instant when $\theta = 0^{\circ}$, determine the angular velocity and angular acceleration of bar OA.



Use the following parameters in your analysis: $\Omega=5 \text{ rad/s}, \dot{\theta}=4 \text{ rad/s}, \ddot{\theta}=-3 \text{ rad/s}^2 \text{ and } L=2 \text{ m.}$

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