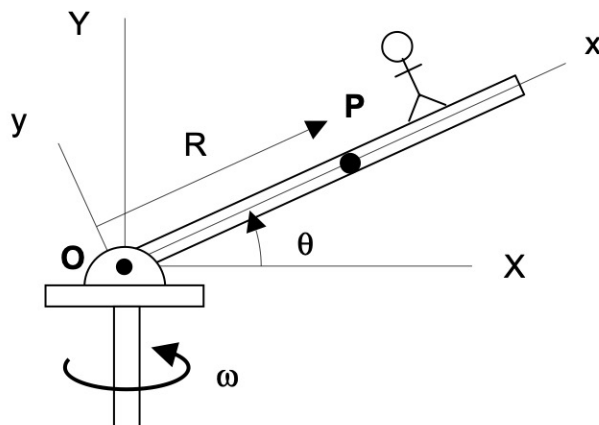


Homework H.3.I

Given: Particle P travels in a tube with $\dot{R} = \text{constant}$. The tube is being raised at a constant rate of $\dot{\theta}$. In addition, the tube is attached to a vertical shaft which is rotating about the fixed Y axis with a constant rate of ω . An observer is attached to the tube with the xyz axes also attached to the tube with its origin at point O.

Find: For the position shown, determine:

- The angular velocity vector of the observer.
- The angular acceleration vector of the observer.
- The velocity of point P as seen by the observer.
- The acceleration of point P as seen by the observer.
- The acceleration of point P using the above results.



Use the following parameters in your analysis: $R = 5 \text{ ft}$, $\theta = 36.87^\circ$, $\dot{R} = 6 \text{ ft/s}$, $\dot{\theta} = 3 \text{ rad/s}$ and $\omega = 4 \text{ rad/s}$.