Problem H1.J

Given: Block A moves to the right with a constant speed of $\dot{x}_A$. An inextensible cable is wrapped around a small pulley on block A, with the left end of the cable attached to a fixed wall and the other end of the cable is attached to particle P. At a given instant in time, it is known that the time derivatives of the rotation angle for the cable are given by $\dot{\theta}$ and $\ddot{\theta}$. Assume that the cable remains taut at all time.

Find: For this instant:

(a) Determine the velocity vector of P.

(b) Determine the acceleration vector of P.
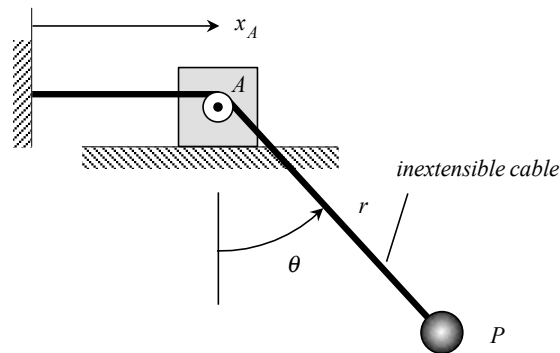
Use the following parameters in your analysis: $\theta = 0$, $\dot{x}_A = 10$ ft/s, $r = 2$ ft, $\dot{\theta} = 3$ rad/s and $\ddot{\theta} = 0$.