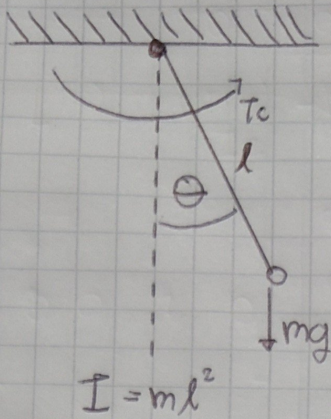


Tarea 4

Pendulo



$$I\ddot{\theta} = T_c - mg l \sin \theta$$

$$\frac{I_c}{ml^2} = \ddot{\theta} + \frac{g}{l} \sin \theta$$

$$q_1 = \theta$$

$$\dot{q}_2 = \dot{q}_1 = \dot{\theta}$$

$$\ddot{q}_2 = \ddot{q}_1 = \ddot{\theta}$$

$$\ddot{\theta} = \frac{I_c}{ml^2} - \frac{g}{l} \sin \theta$$

$$\ddot{q}_2 = \frac{I_c}{ml^2} - \frac{g}{l} \sin q_1$$

$$m = 1$$

$$l = 1$$

$$g = 9.8$$

$$\Rightarrow \begin{bmatrix} \ddot{q}_1 \\ \ddot{q}_2 \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ -\frac{g \sin \theta}{l} & 0 \end{bmatrix} \begin{bmatrix} q_1 \\ q_2 \end{bmatrix} + \begin{bmatrix} 0 \\ \frac{1}{ml^2} \end{bmatrix} [I_c]$$

$$\begin{bmatrix} q_1 \end{bmatrix} = \begin{bmatrix} 1 & 0 \end{bmatrix} \begin{bmatrix} q_1 \\ q_2 \end{bmatrix}$$