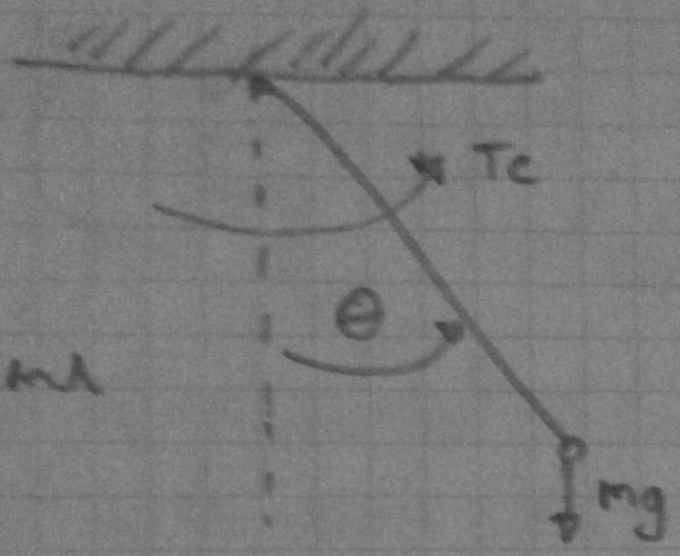
Tarea #4.



$$Tc - mgl\,\text{sen}\,\theta = I\ddot{\theta}$$

$$\ddot{\theta} + \frac{g}{l}\,\text{sen}\,\theta = \frac{Tc}{ml^2}$$

$$\ddot{\theta} = \frac{Tc}{ml^2} - \frac{g}{l}\,\text{sen}\,\theta \quad (1)$$

$$q_1 = \theta \;;\; q_2 = \dot{q}_1 = \dot{\theta} \;;\; \dot{q}_2 = \ddot{\theta}$$

(1) $\dot{q}_2 = \frac{Tc}{ml^2} - \frac{g}{l}\,\text{sen}\,q_1$

$$\begin{bmatrix} \dot{q}_1 \\ \dot{q}_2 \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ -\frac{g}{l}\,\text{sen}\,\theta & 0 \end{bmatrix} \begin{bmatrix} q_1 \\ q_2 \end{bmatrix} + \begin{bmatrix} 0 \\ \frac{1}{ml^2} \end{bmatrix} Tc.$$

$$[\theta] = [1 \quad 0] \begin{bmatrix} q_1 \\ q_2 \end{bmatrix}$$