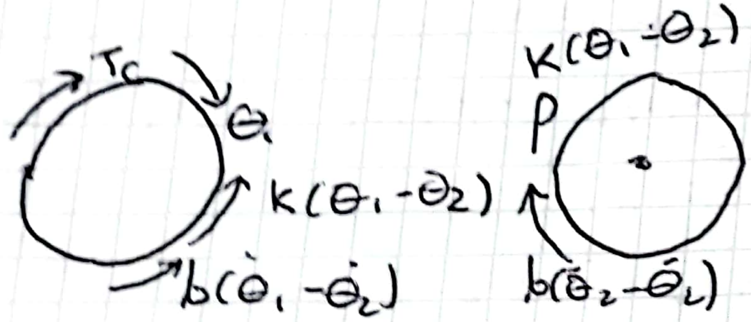
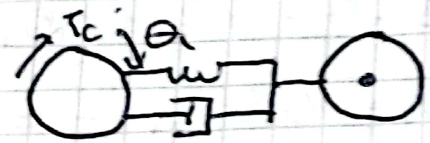
$$\begin{bmatrix}\theta_1\\ \theta_2\end{bmatrix} = \begin{bmatrix}10 & 0\\ 00 & 10\end{bmatrix}$$

Tarea #2.





1) $T_c - K(\theta_1-\theta_2) - b(\dot\theta_1-\dot\theta_2) = I\ddot\theta_1$

2) $b(\dot\theta_1-\dot\theta_2) + K(\theta_1-\theta_2) = I_2\ddot\theta_2$

$$\frac{T_c}{I_1} - \frac{K(\theta_1)}{I_1} + \frac{K\theta_2}{I_1} - \frac{b\dot\theta_1}{I} + \frac{b\dot\theta_2}{I} = \ddot\theta_1$$

$$\frac{T_c}{I_1} - \frac{K_1}{I_1} q_1 + \frac{K q_3}{I_1} - \frac{b q_2}{I_1} + \frac{b q_4}{I} = q_2''$$

$q_1 = \theta_1$ $\qquad$ $q_3 = \theta_2$

$q_2 = \dot{\theta}_1 = \dot{q}_1$ $\qquad$ $q_4 = \dot{\theta}_2 = \dot{q}_3$

$\dot{q}_2 = \ddot{\theta}_1$ $\qquad$ $\dot{q}_4 = \ddot{\theta}_2$

$$\frac{b\dot{\theta}_1}{I_2} - \frac{b\dot{\theta}_2}{I_2} + \frac{K\theta_1}{I_2} - \frac{K\theta_2}{I_2} = \ddot{\theta}_2$$

$$\frac{b q_2}{I_2} - \frac{b q_4}{I_2} + \frac{K q_1}{I_2} - \frac{K q_3}{I_2} = \dot{q}_4$$

$$\begin{bmatrix} \dot{q}_1 \\ \dot{q}_2 \\ \dot{q}_3 \\ \dot{q}_4 \end{bmatrix} = \begin{bmatrix} 0 & 1 & 0 & 0 \\ -\frac{K}{I_1} & -\frac{b}{I_1} & \frac{K}{I_1} & \frac{b}{I_1} \\ 0 & 0 & 0 & 1 \\ 0 & \left(\frac{K+b}{I_2}\right) & -\frac{K}{I_2} & -\frac{b}{I_2} \end{bmatrix} \begin{bmatrix} q_1 \\ q_2 \\ q_3 \\ q_4 \end{bmatrix} + \begin{bmatrix} 0 \\ \frac{1}{I_1} \\ 0 \\ 0 \end{bmatrix} T_c$$

$$\begin{bmatrix} \theta_1 \\ \theta_2 \end{bmatrix} = \begin{bmatrix} 1 & 0 & 1 & 0 \end{bmatrix} \begin{bmatrix} q_1 \\ q_2 \\ q_3 \\ q_4 \end{bmatrix}$$