



Respostas da Lista 4

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1.

$$\begin{bmatrix} F_1 + F'_1 \\ F_2 - F'_2 \\ F_3 + F'_3 \end{bmatrix} = \begin{bmatrix} 0 \\ mg \operatorname{sen}(\theta) \\ mg \operatorname{cos}(\theta) \end{bmatrix}$$

$$\begin{bmatrix} F_3 \frac{L}{2} - F'_3 \frac{L}{2} \\ 0 \\ F_1 \frac{L}{2} - F'_1 \frac{L}{2} \end{bmatrix} = \begin{bmatrix} I_2 \ddot{\theta} + (I_2 - I_1)(\omega_1 \operatorname{sen}(\theta) + \omega_2)\omega_1 \operatorname{cos}(\theta) \\ I_1 \omega_1 \dot{\theta} \operatorname{cos}(\theta) \\ (I_1 - I_2)\dot{\theta}(\omega_1 \operatorname{sen}(\theta) + \omega_2) - I_2 \omega_1 \dot{\theta} \operatorname{sen}(\theta) \end{bmatrix}$$

2.

$$4mL^2 \ddot{\theta} \operatorname{sen}^2(\theta) + 4mL^2 \dot{\theta}^2 \operatorname{sen}(2\theta) + mL^2 \ddot{\theta} - 2mL^2 \dot{\theta}^2 \operatorname{sen}(2\theta) - \frac{1}{2}m\Omega^2 L^2 \operatorname{sen}(2\theta) + \\ + 4KL^2 \operatorname{sen}(\theta) - 2KL^2 \operatorname{sen}(2\theta) - 3mgL \operatorname{sen}(\theta) = 0$$

3.

$$F = 294,52N$$

4.

$$F = \begin{bmatrix} 2x\rho(\ddot{x} - x\Omega^2) + 2\dot{x}\rho \\ 4x\rho\dot{x}\Omega \end{bmatrix}$$