

Pauta P2, aux 7

$$\hat{A} \quad -N = -mR\dot{\theta}^2$$

$$N = mR\dot{\theta}^2$$

$$\hat{\theta} \quad -Fr = mR\ddot{\theta} \quad \text{pero } Fr = \mu N$$

$$-\mu mR\dot{\theta}^2 = mR\ddot{\theta}$$

$$-\mu\dot{\theta}^2 = \ddot{\theta} \quad (*)$$

$$-\mu\dot{\theta}^2 = \frac{d\dot{\theta}}{d\theta}$$

$$-\mu d\theta = \frac{d\dot{\theta}}{\dot{\theta}} \quad \int_0^{\theta} \quad \int_{\frac{v_0}{R}}^{\dot{\theta}}$$

$$-\mu\theta = \ln\left(\frac{R\dot{\theta}}{v_0}\right) \quad / \text{expl()}$$

$$e^{-\mu\theta} = \frac{R\dot{\theta}}{v_0}$$

$$\dot{\theta} = \frac{v_0}{R} e^{-\mu\theta}$$

$$\rightarrow v(\pi) = R\dot{\theta}(\pi) = v_0 e^{-\mu\pi}$$

Para el tiempo, volvemos a (*)

$$-\mu\dot{\theta}^2 = \ddot{\theta}$$

$$-\mu\dot{\theta}^2 = \frac{d\dot{\theta}}{dt}$$

$$-\mu dt = \frac{d\dot{\theta}}{\dot{\theta}^2} = (\dot{\theta})^{-2} d\dot{\theta} \quad \int_0^{t^*} \quad \int_{\frac{v_0}{R}}^{\dot{\theta}(t)}$$

$$-\mu (z^* - 0) = -(\dot{\Theta})^{-1} \frac{v_0}{R} e^{-\mu z^*}$$

$$-\mu z^* = \frac{R}{v_0} - \frac{R e^{\mu z^*}}{v_0}$$

$$z^* = \frac{R}{\mu v_0} (e^{\mu z^*} - 1)$$