

$$\hat{e} = \sin \theta \hat{\rho} + \cos \theta \hat{\theta}$$

$$\Rightarrow m \vec{a} = m g \cos \theta \hat{\rho} - m g \sin \theta \hat{\theta} - N \hat{\rho} + m a_0 \sin \theta \hat{\rho} + m a_0 \cos \theta \hat{\theta}$$

$$\vec{a} = R \ddot{\theta} \hat{\rho} + R \dot{\theta}^2 \hat{\theta}$$

$$\hat{\rho} : -m R \dot{\theta}^2 = m g \cos \theta - N + m a_0 \sin \theta \quad (1)$$

$$\hat{\theta} : m R \ddot{\theta} = -m g \sin \theta + m a_0 \cos \theta \quad (2)$$

La velocidad de la partícula con respecto al bloque es

$$\vec{v} = R \dot{\theta} \hat{\theta}$$

$$v_{\max} \rightarrow \dot{\theta} = 0$$

$$(1) \Rightarrow m g \sin \theta = m a_0 \cos \theta$$

$$\tan \theta = \frac{a_0}{g} = 1 \rightarrow \theta^* = \frac{\pi}{4}$$

$$R \dot{\theta} d\theta = a_0 \cos \theta d\theta - g \sin \theta d\theta / \int_{\theta_0}^{\theta} \int_{a_0}^{\theta}$$

$$\Rightarrow \int_0^{\theta_{\max}} R \dot{\theta} d\theta = \int_0^{\pi/4} a_0 \cos \theta d\theta - \int_0^{\pi/4} g \sin \theta d\theta$$

$$\frac{R \dot{\theta}_{\max}^2}{2} = a_0 \sin \frac{\pi}{4} + g \cos \frac{\pi}{4} - g \cos 0$$