

$$\vec{a}_0 = -b\omega_0^2 \hat{r}$$

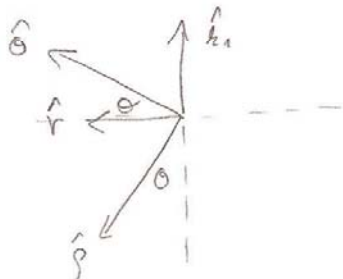
PAUTA P2 C3 2008-1
GABRIEL CUEVAS

$$\vec{r}' = L \hat{p}$$

$$\vec{v}' = L \dot{\theta} \hat{\theta}$$

$$\vec{a}' = -L\ddot{\theta}^2 \hat{p} + L\ddot{\theta} \hat{\theta}$$

$$\vec{\omega} = \omega_0 \hat{h}_1$$



a)	1PT
b)	3 PT
c)	1 PT
d)	1 PT

a) $N=0$
(give a ω de) 1PT

$$\hat{h}_1 = -\hat{p} \cos \theta + \hat{\theta} \sin \theta$$

$$\hat{r} = \hat{p} \sin \theta + \hat{\theta} \cos \theta$$

$$\vec{\omega} = \omega_0 (-\cos \theta \hat{p} + \sin \theta \hat{\theta})$$

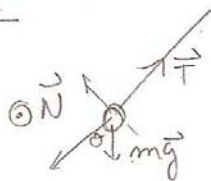
$$\vec{a}_0 = -b\omega_0^2 (\sin \theta \hat{p} + \cos \theta \hat{\theta})$$

$$\begin{aligned} \vec{\omega} \times \vec{r}' &= \omega_0 (-\cos \theta \hat{p} + \sin \theta \hat{\theta}) \times L \hat{p} \\ &= -L\omega_0 \sin \theta \hat{h} \end{aligned}$$

$$\begin{aligned} \vec{\omega} \times \vec{\omega} \times \vec{r}' &= \omega_0 (-\cos \theta \hat{p} + \sin \theta \hat{\theta}) \times (-L\omega_0 \sin \theta \hat{h}) \\ &= -L\omega_0^2 \cos \theta \sin \theta \hat{\theta} - L\omega_0^2 \sin^2 \theta \hat{p} \end{aligned}$$

$$\begin{aligned} 2\vec{\omega} \times \vec{v}' &= 2\omega_0 (-\cos \theta \hat{p} + \sin \theta \hat{\theta}) \times L\dot{\theta} \hat{\theta} \\ &= -2L\omega_0 \dot{\theta} \cos \theta \hat{h} \end{aligned}$$

DCL



$$\begin{aligned} \hat{p}) -T + mg \cos \theta &= m(-b\omega_0^2 \sin \theta - L\ddot{\theta}^2 - L\omega_0^2 \sin^2 \theta) \\ \hat{\theta}) -mg \sin \theta &= m(-b\omega_0^2 \cos \theta + L\ddot{\theta} - L\omega_0^2 \sin \theta \cos \theta) \\ \hat{h}) -N &= -2mL\omega_0 \dot{\theta} \cos \theta \end{aligned}$$

$$\textcircled{2} \quad -\frac{g}{L} \sin \theta + \frac{b}{L} \omega_0^2 \cos \theta + \frac{\omega_0^2}{2} \sin 2\theta = \ddot{\theta}$$

$$\int_0^{\dot{\theta}} \ddot{\theta} d\dot{\theta} = \int_0^{\theta} \left(-\frac{g}{L} \sin \theta + \frac{b}{L} \omega_0^2 \cos \theta + \frac{\omega_0^2}{2} \sin 2\theta \right) d\theta$$

$$\frac{\dot{\theta}^2}{2} = -\frac{g}{L} (1 - \cos \theta) + \frac{b}{L} \omega_0^2 \sin \theta + \frac{\omega_0^2}{4} (1 - \cos 2\theta)$$

$$\dot{\theta}^2 = -\frac{2g}{L} (1 - \cos \theta) + \frac{2b}{L} \omega_0^2 \sin \theta + \frac{\omega_0^2}{2} (1 - \cos 2\theta)$$

$$\Rightarrow N = 2mL \omega_0 \left[-\frac{2g}{L} (1 - \cos \theta) + \frac{2b}{L} \omega_0^2 \sin \theta + \frac{\omega_0^2}{2} (1 - \cos 2\theta) \right]^{1/2} \cos \theta$$

d) Había que justificar $\cos \theta = 0 \vee \dot{\theta} = 0$