

BAREM DE NOTARE – problema 2 ...balamale

A)	3,00 p.
$\vec{p}_f - \vec{p}_i = (\vec{F} + \vec{R})\tau$	0,50 p.
$\vec{J}_f - \vec{J}_i = \vec{M}\tau$	0,50 p.
$\vec{p}_f = \vec{0}$	0,10 p.
$\vec{J}_f = \vec{0}$	0,10 p.
$\vec{R} = \vec{0}$	0,10 p.
$p_i = m\omega \frac{L}{2}$	0,25 p.
$J_i = I\omega = \frac{mL^2}{3}\omega$	1,00 p.
$M = D \cdot F$	0,20 p.
$D = \frac{2}{3}L$	0,25 p.
B)	7,00 p.
a) $\frac{I_A\omega^2}{2} - 0 = ma\left(\frac{L}{2}\cos\theta - \frac{L}{2}\cos\theta_0\right)$	0,75 p.
$\omega^2 = \frac{3a}{L}(\cos\theta - \cos\theta_0) \cong \frac{3a}{L}\left(1 - \frac{\theta^2}{2} - 1 + \frac{\theta_0^2}{2}\right) = \frac{3a}{2L}(\theta_0^2 - \theta^2)$	0,50 p.
$\omega = -d\vartheta/dt$	0,25 p.
$\tau = \sqrt{\frac{2L}{3a}} \arcsin \frac{\theta}{\theta_0} \Big _0^{\theta_0} = \frac{\pi}{2} \sqrt{\frac{2L}{3a}}$	0,50 p.
b) $D = \frac{a\tau^2}{2} = \frac{\pi^2}{12}L$	0,50 p.
c) $ma_{tg} = masin\theta - F_{\perp}$	0,75 p.
$a_{tg} = \varepsilon \frac{L}{2}$	0,50 p.
$ma_{cp} = F_{\parallel} - macos\theta$	0,75 p.
$a_{cp} = \omega^2 \frac{L}{2}$	0,25 p.
$I_A\varepsilon = ma\frac{L}{2}sin\theta$	0,75 p.
$\varepsilon = \frac{3a}{2L}sin\theta$	0,25 p.
$F = \sqrt{F_{\parallel}^2 + F_{\perp}^2} = \frac{ma}{4}\sqrt{99cos^2\theta - 120cos\theta_0cos\theta + 36cos^2\theta_0 + 1}$	0,50 p.
$\theta_1 = 0$	0,50 p.
$F_{max} = \frac{ma}{2}(5 - 3cos\theta_0) \cong ma\left(1 + \frac{3}{4}\theta_0^2\right)$	0,25 p.
TOTAL	10 p.