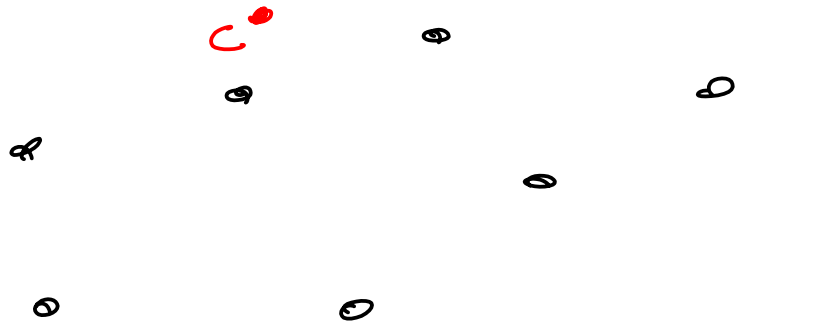
TALLER 4

$K_i = \frac{1}{2} m_i v_i^2$ → $v_i = r_i \omega$

ω

$K_i = \frac{1}{2} m_i r_i^2 \omega^2$



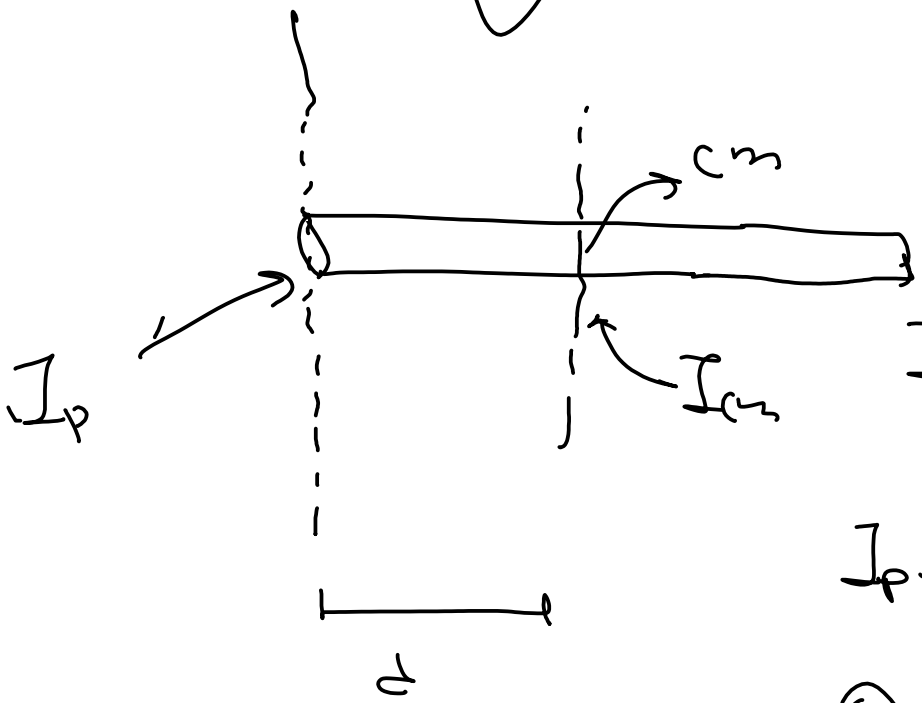
$K_T = \sum \frac{1}{2} m_i r_i^2 \omega^2$

$K_T = \frac{1}{2} \left(\sum m_i r_i^2 \right) \omega^2$

Inercia

Esfera $= \frac{2}{5} m R^2$

Barra (centro) $= \frac{1}{12} m L^2$



$I_p = I_{cm} + M d^2$

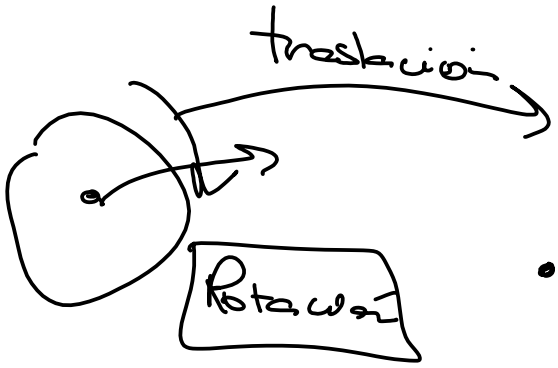
$I_p = \frac{1}{12} M L^2 + M \left(\frac{L}{2} \right)^2$

$I_p = M L^2 \left(\frac{1}{12} + \frac{1}{4} \right)$

$I_p = \frac{1}{3} M L^2$

d

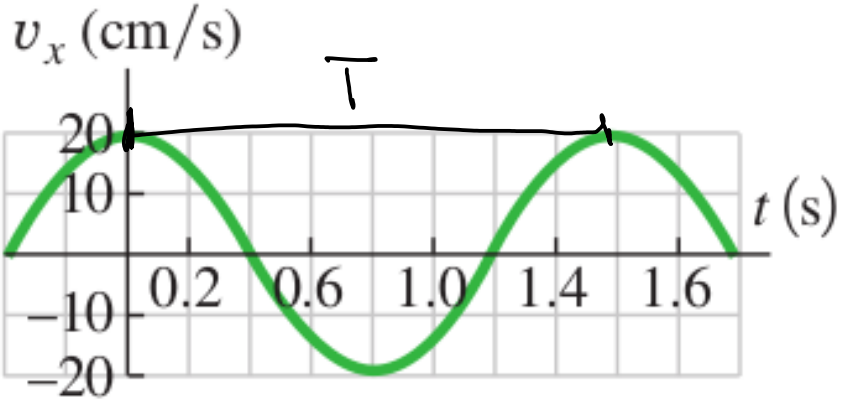
$\frac{1}{3}$



→ Mov. con eje móvil.

$$K = K_R + K_{Tr} = \frac{1}{2} I\omega^2 + \frac{1}{2} m v_{cm}^2$$

Rueda sin resbalar → $v_{cm} = R\omega$



a) $T = 1.5\,s$ b) $\nu = \frac{1}{T} = 0.667\,rev/s$.

c) $\omega = \frac{2\pi}{1.5} = 4.19\,rad/s$

d) $A = ?$ $\frac{1}{2} k A^2 = \frac{1}{2} m v_{max}^2$ $\Rightarrow A = \sqrt{\frac{m}{k}}\, v_{max}$

$A = \sqrt{\frac{m}{k}}\, v_{max}$ $\longrightarrow$ $A = \frac{v_{max}}{\omega}$

$\hookrightarrow \omega = \sqrt{\frac{K}{m}}$

$\hookrightarrow 1/\omega$

$A = 4.77\,cm$

e) $x(t) = A\,sen(\omega t + \phi)$

$a(t) = -\omega^2 A\, \underbrace{sen(\omega t + \phi)}_{\text{maxima } = 1}$

$a_{max} = -\omega^2 A$

$|a_{max}| = \omega^2 A = 0.837\, m/s^2$.

f) $m = ?$ $\omega^2 = \frac{K}{m}$ $\rightarrow m = 4.27\,kg$

$$\boxed{\ddot{x} + \omega^2 x = 0}$$

Ej 1 (mart.)

70%

Ej 2 (El)

$w(y) = \lambda g y$

30%

$Y = \dfrac{F/A}{\Delta \ell / \ell}$ → $F = \lambda g$ ✓