

Zad. 4

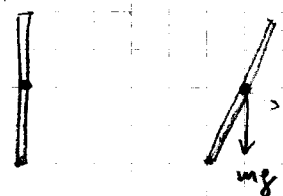
zakone

$$I_1 \omega_1 = I_2 \omega_2$$

$$I_1 = \frac{1}{2} R^2 M + 2 \left( \frac{r}{2} \right)^2 m$$

$$I_2 = \frac{1}{2} R^2 M + 2 \left( \frac{r}{2} \right)^2 m$$

ZAD. 5



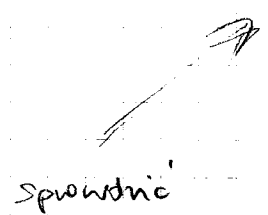
a) 2. zakon Newtona en.

$$\left( 0 - mg \frac{R}{2} \right) + \left( \frac{I \omega^2}{2} - 0 \right) = 0$$

b)  $|\vec{M}| = mg \cdot \frac{R}{2} = I \epsilon$

$$\epsilon = \frac{mg R}{2 I} = \frac{mg R}{2 \cdot \frac{1}{3} R^2 M} = \frac{3}{2} \frac{mg}{R}$$

$$I = \frac{1}{12} M R^2 + M \left( \frac{R}{2} \right)^2 = \frac{1}{3} R^2 M$$



$$mg \frac{R}{2} = \left( \frac{1}{12} M R^2 + M \left( \frac{R}{2} \right)^2 \right) \frac{\omega^2}{2}$$

$$\frac{g R}{2 \cdot \frac{1}{3} R^2} = \frac{\omega^2}{2}$$

$$\left( \frac{1}{12} + \frac{3}{12} \right) = \frac{4}{12} = \frac{1}{3}$$

$$\omega = \sqrt{\frac{3g}{R}}$$