

$$\sum F_x = m \cdot a_{cm,x} \Rightarrow a_{cm,x} = \frac{F \sin \varphi}{m} \quad (1)$$

$$\sum F_y = m \cdot a_{cm,y} \Rightarrow a_{cm,y} = \frac{F \cos \varphi}{m} \quad (2)$$

$$a_{cm} = \sqrt{a_{cm,x}^2 + a_{cm,y}^2} = \frac{F}{m} \quad (3)$$

$$\sum \tau = I \cdot \alpha \Rightarrow F \cos \varphi \cdot R = I \cdot \alpha \Rightarrow \alpha = \frac{F \cdot \cos \varphi \cdot R}{I} \quad (4)$$

$$\text{και } a_E = \alpha \cdot R = \frac{F \cdot \cos \varphi \cdot R}{I} \quad (5)$$

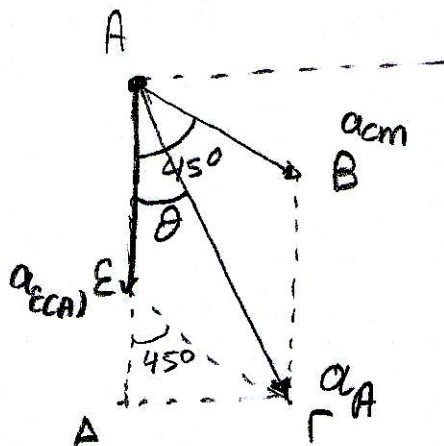
Αριθμητική εφαρμογή

$$m = 1 \text{ kg}, F = 10 \text{ N}, \varphi = 45^\circ, I = \frac{2}{5} m R^2, R = 1 \text{ m}$$

$$(3) \Rightarrow a_{cm} = \frac{10}{1} = 10 \text{ m/s}^2$$

$$(4) \Rightarrow \alpha = 10\sqrt{2} \text{ r/s}^2 \quad \text{και } a_{E(A)} = 10\sqrt{2} \text{ m/s}^2$$

Επει



$$\epsilon \varphi \theta = \frac{\Delta \Gamma}{AE + E\Delta} = \frac{a_{cm} \cdot \cos 45^\circ}{a_{E(A)} + a_{cm} \sin 45^\circ} = \frac{10 \frac{\sqrt{2}}{2}}{10\sqrt{2} + 10 \frac{\sqrt{2}}{2}}$$

$$\Rightarrow \epsilon \varphi \theta = \frac{5\sqrt{2}}{15\sqrt{2}} = \frac{1}{3} \Rightarrow \theta \approx 18,4^\circ$$