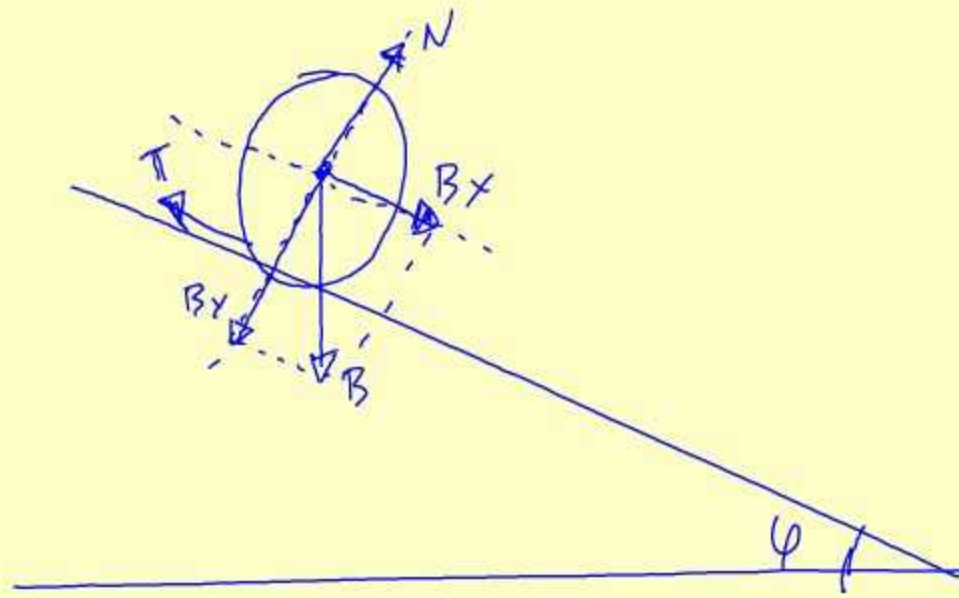


# Hom 4.67

$$I = \frac{1}{2} m R^2$$

i)  $a_k = j$

ii)  $\mu = j$



$$\Sigma F = m a_k \Rightarrow m g \sin \phi - T = m a_k \quad (1)$$

$$\Sigma \tau = I \alpha_{\text{rot}} \Rightarrow T \cdot R = \frac{1}{2} m R^2 \alpha_{\text{rot}}$$

$$T = \frac{1}{2} m a_k \quad (2)$$

i) (1), (2)  $\Rightarrow m g \sin \phi = m a_k + \frac{1}{2} m a_k$

$$g \sin \phi = \frac{3}{2} a_k$$

$$a_k = \frac{2}{3} g \sin \phi$$

ii) (2)  $\Rightarrow T = \frac{1}{2} m \cdot \frac{2}{3} g \sin \phi$

$$\mu N = \frac{1}{3} m g \sin \phi$$

ομως  $N = B \cos \phi = m g \cos \phi$   $\Rightarrow \mu m g \cos \phi = \frac{1}{3} m g \sin \phi$

$$\mu = \frac{1}{3} \tan \phi$$