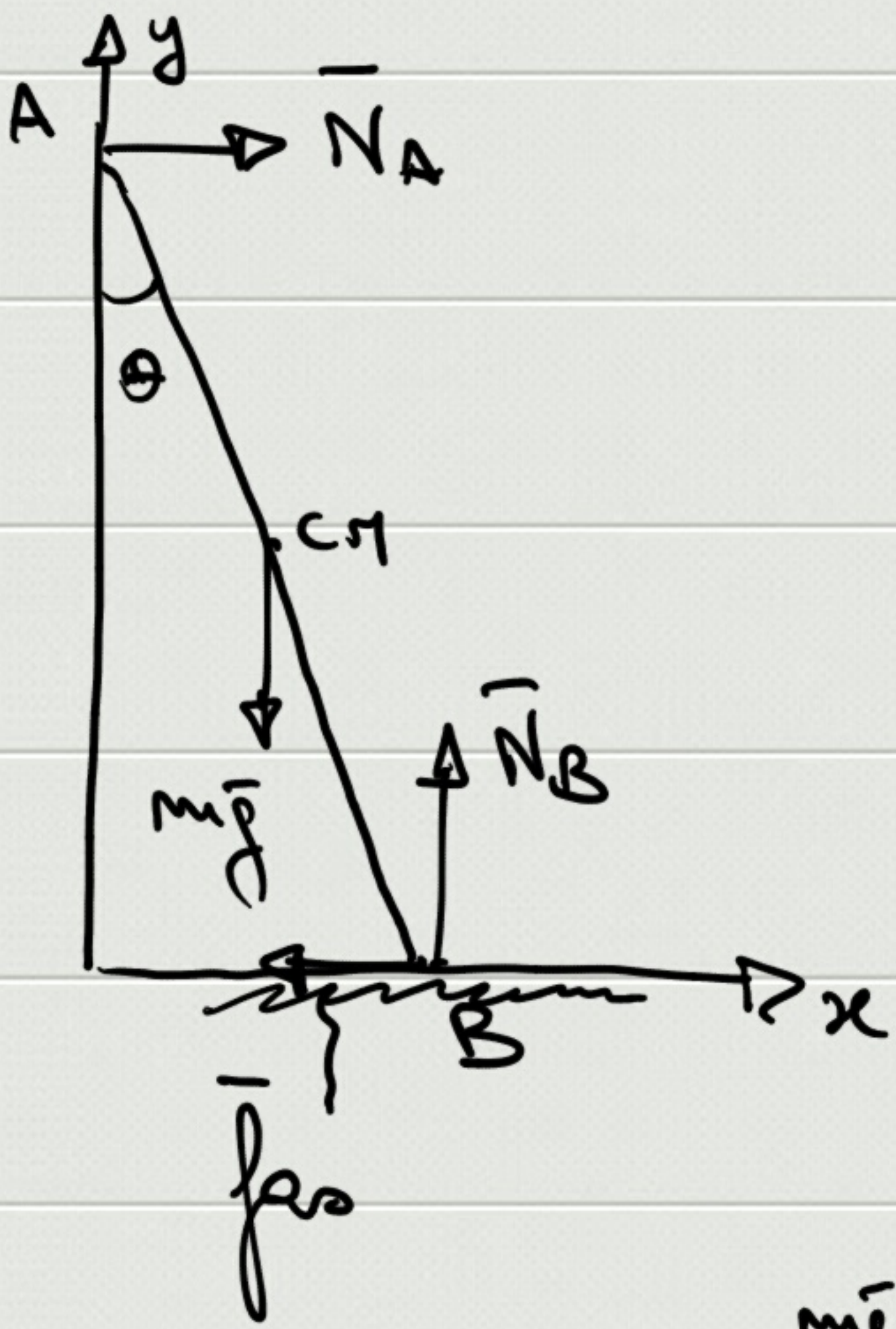


$$\vec{R}^E = m \vec{a}_{cm}$$

$$\vec{M}_O^E = \vec{I}_O \vec{\alpha}$$

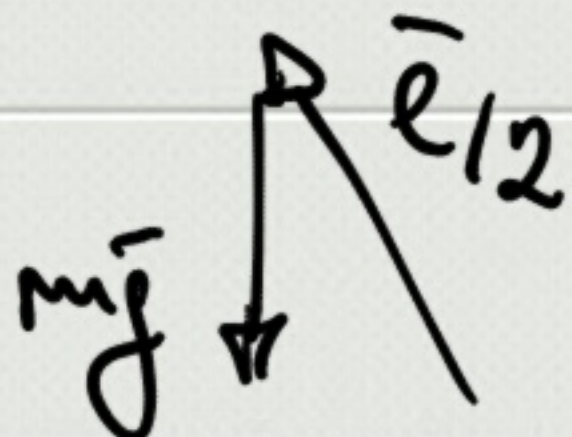
$$v_0 = \omega_0 = 0$$

$$\vec{R}^E = \vec{M}_O^E = 0 \Rightarrow \underline{\underline{\text{statics}}}$$

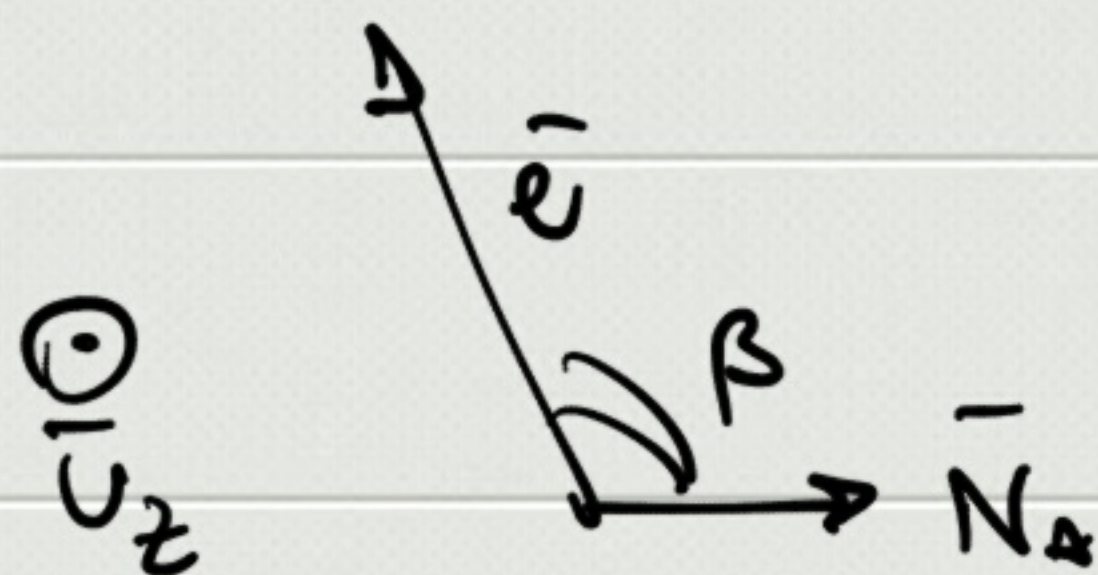


$$AB = l, m$$

$$\vec{R}^E = 0 \quad \left\{ \begin{array}{l} x : N_A = f_{\text{ro}} \\ y : N_B = mg \end{array} \right.$$



$$\vec{M}_B^E = 0 \Rightarrow \frac{l}{2} \times mg + \vec{l} \times \vec{N}_A = 0$$



$$\Rightarrow \frac{l}{2} mg \sin(\pi - \theta) \bar{u}_z + l N_A \sin\left(\frac{\pi}{2} + \theta\right) (-\bar{u}_z) = 0$$

$$\Rightarrow \frac{1}{2} mg \sin \theta - N_A \cos \theta = 0 \Rightarrow N_A = \frac{1}{2} mg \tan \theta$$

$$N_A = \frac{1}{2} mg \tan \theta$$

$$f_{\text{fr}} \leq \mu_s N_B = \mu_s mg$$

$$\left. \begin{array}{l} N_A = \frac{1}{2} mg \tan \theta \\ f_{\text{fr}} \leq \mu_s N_B = \mu_s mg \end{array} \right\} \Rightarrow$$

$$\Rightarrow \frac{1}{2} mg \tan \theta \leq \mu_s mg \Rightarrow \boxed{\mu_s \geq \frac{1}{2} \tan \theta}$$

