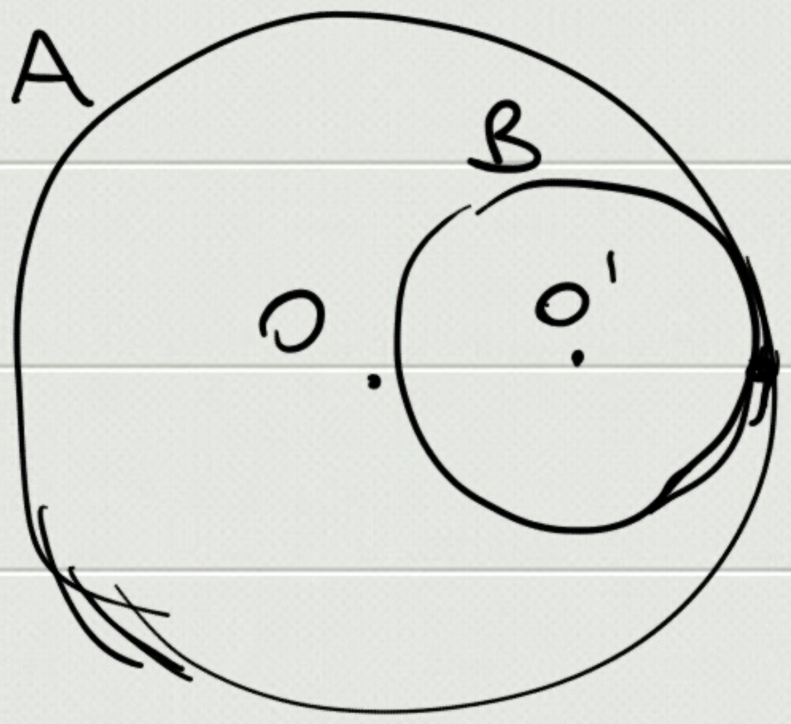
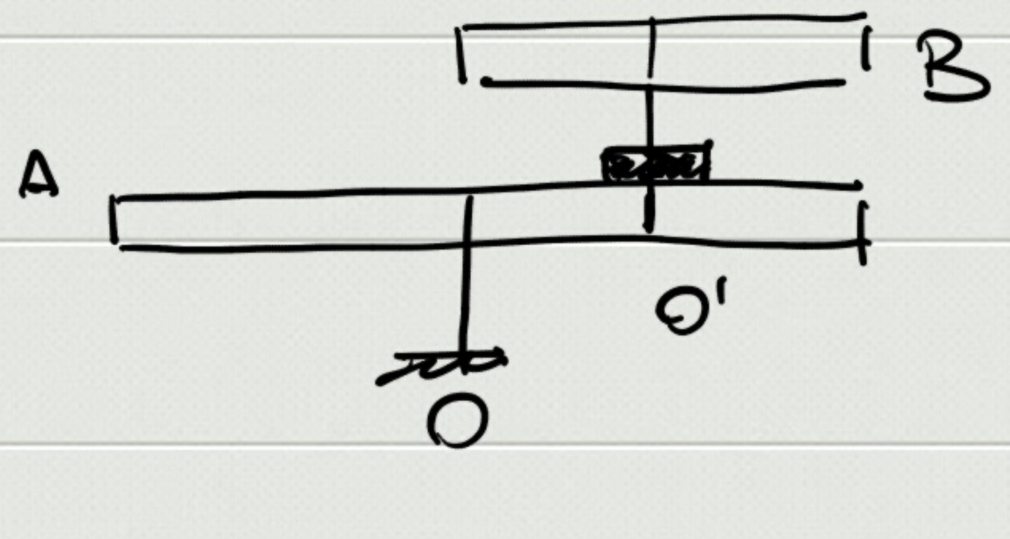
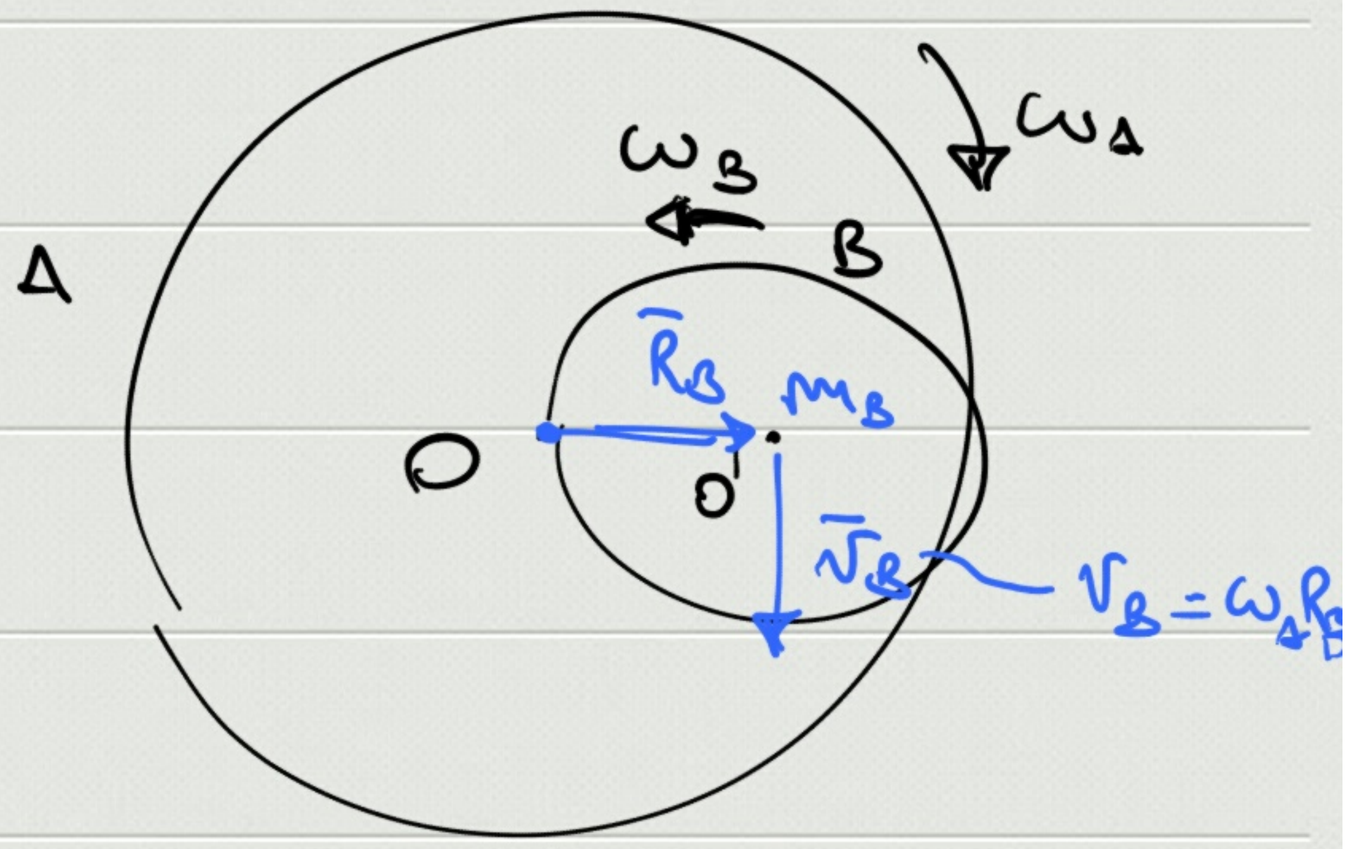




$m_A = 20\ kg \qquad m_B = \frac{m_A}{4} \qquad R_A = 1\ m \qquad R_B = \frac{R_A}{2}$

$\omega_{0A} = \omega_{0B} = 0 \qquad M_{O'} = 10\ N\,m$

$\omega_B = ? \qquad \omega_A = 5\ rad/s$



$\bar{L} = const = 0$

$\bar{L}_{O=0} = \bar{I}_A \bar{\omega}_A + \bar{I}_B \bar{\omega}_B$

$= \bar{I}_A \bar{\omega}_A + \bar{I}_B \bar{\omega}_B + \bar{R}_B \times m_B \bar{v}_B \quad * \left(\bar{L}_O = \bar{L}'_{CM} + \bar{L}_{O,CM}\right)$

$= I_A \omega_A - I_B \omega_B + R_B m_B v_B \quad *$

$= I_A \omega_A + I_B \omega_B + R_B m_B v_B \qquad \underline{Nb}$

$$\Rightarrow \quad 0 = \frac{1}{2} M_A R_A^2 \omega_A - \frac{1}{2} M_B R_B^2 \omega_B + R_B M_B \omega_A R_B$$

$$\Rightarrow \omega_B = +18\, \omega_A = 90 \text{ rad/s}$$

$\alpha_A = ?$ $\qquad \frac{d}{dt}$ $\qquad \Rightarrow \alpha_A = 0.\bar{8} \text{ rad/s}^2$

- ~~$\alpha_A = 0$~~

- $I_A \alpha_A - I_B \alpha_B + R_B M_B R_B \alpha_A = 0 \qquad \alpha_B = \frac{M_{O'}}{I_B} \quad *$

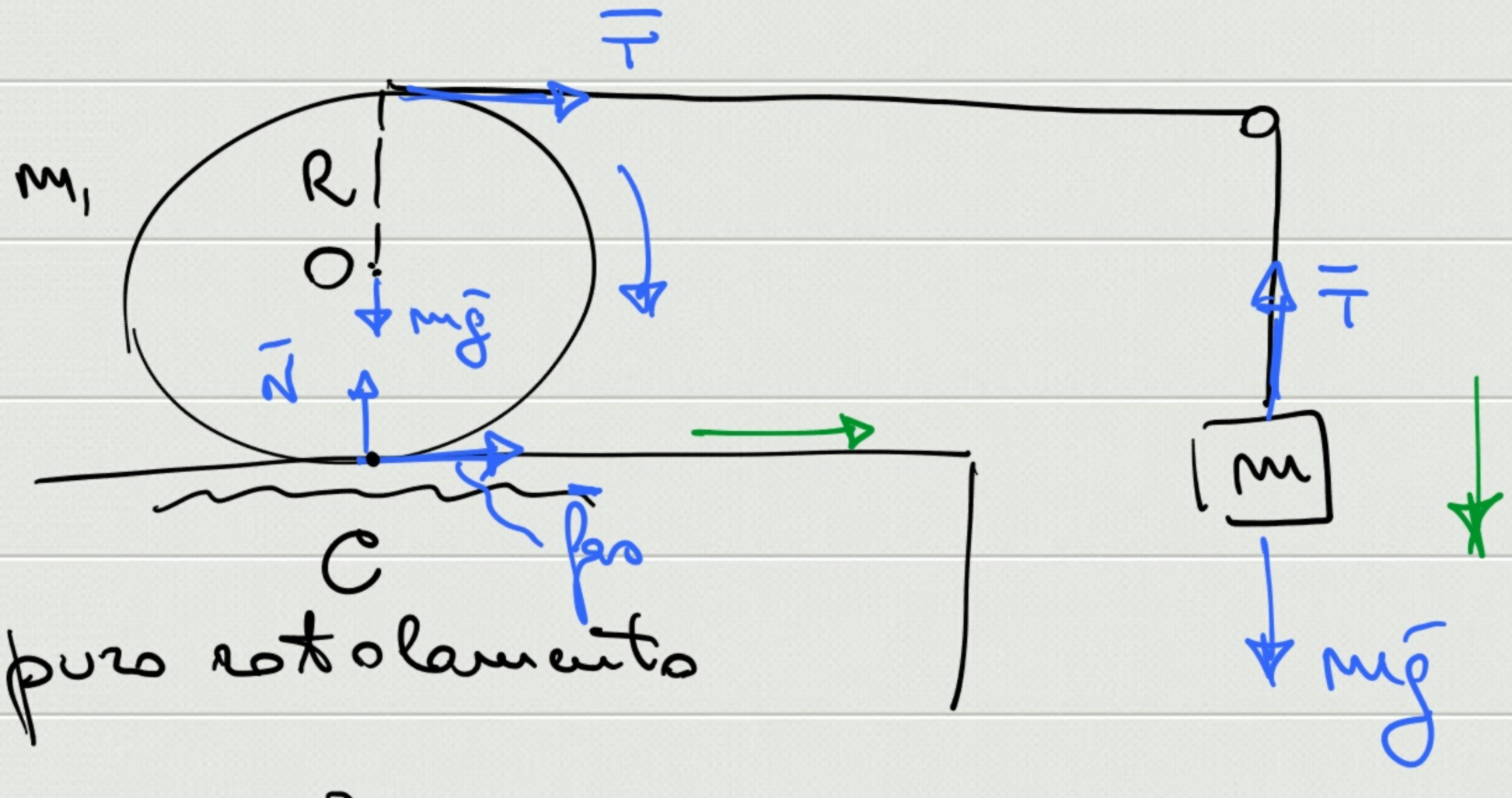
- $\alpha_A = \frac{1}{18} \alpha_B \qquad \alpha_B = \frac{M_{O'}}{I_B} \quad * \qquad M_{O'} = I_B \alpha_B$

- $\alpha_A = \dfrac{M_{O'}}{I_A + \left(I_B + M_B R_B^2\right)}$

$\omega_A^* \left(\omega_B^* = 0\right) = ?$ $\qquad \boxed{L_O = 0}$

$\omega_A^* = \omega_A \qquad \omega_A^* = -\omega_A$

$\boxed{\omega_A^* = 0} \qquad \omega_A^* = -\omega_B$



$a_{CM} = ?$

$$\bar{M}^{\varepsilon}_{polo} = I_z \bar{\alpha}$$

$$-RT + R f_{as} = \frac{1}{2} m R^2 \alpha$$

$$2RT = \left(\frac{1}{2} m R^2 + m R^2\right)\alpha \quad *$$

$$2RT = \frac{1}{2} m R^2 \alpha$$

$$RT - R f_{as} = \frac{1}{2} m R^2 \alpha \quad *$$

$$\begin{cases} m\bar{g} - \bar{T} = m\bar{a} \\ T + f_{as} = m a_{CM} \\ RT - R f_{as} = \frac{1}{2} m R^2 \alpha = \frac{1}{2} m R^{\not 2} \frac{a_{CM}}{\not R} \\ a = a_T = 2 a_{CM} \end{cases}$$

$$\begin{cases} mg - T = 2ma_{CM} \\ 2T = \frac{3}{2}ma_{CM} \end{cases} \Rightarrow T = \frac{3}{4}ma_{CM}$$

$$mg - \frac{3}{4}ma_{CM} = 2ma_{CM} \Rightarrow \boxed{a_{CM} = \frac{4}{11}g}$$

$\mu_s = ?$

$$f_{sr} = ma_{CM} - T = \frac{1}{4}ma_{CM} = \frac{1}{11}mg \leq \mu_s mg$$

$$\Rightarrow \boxed{\mu_s \geq \frac{1}{11}}$$