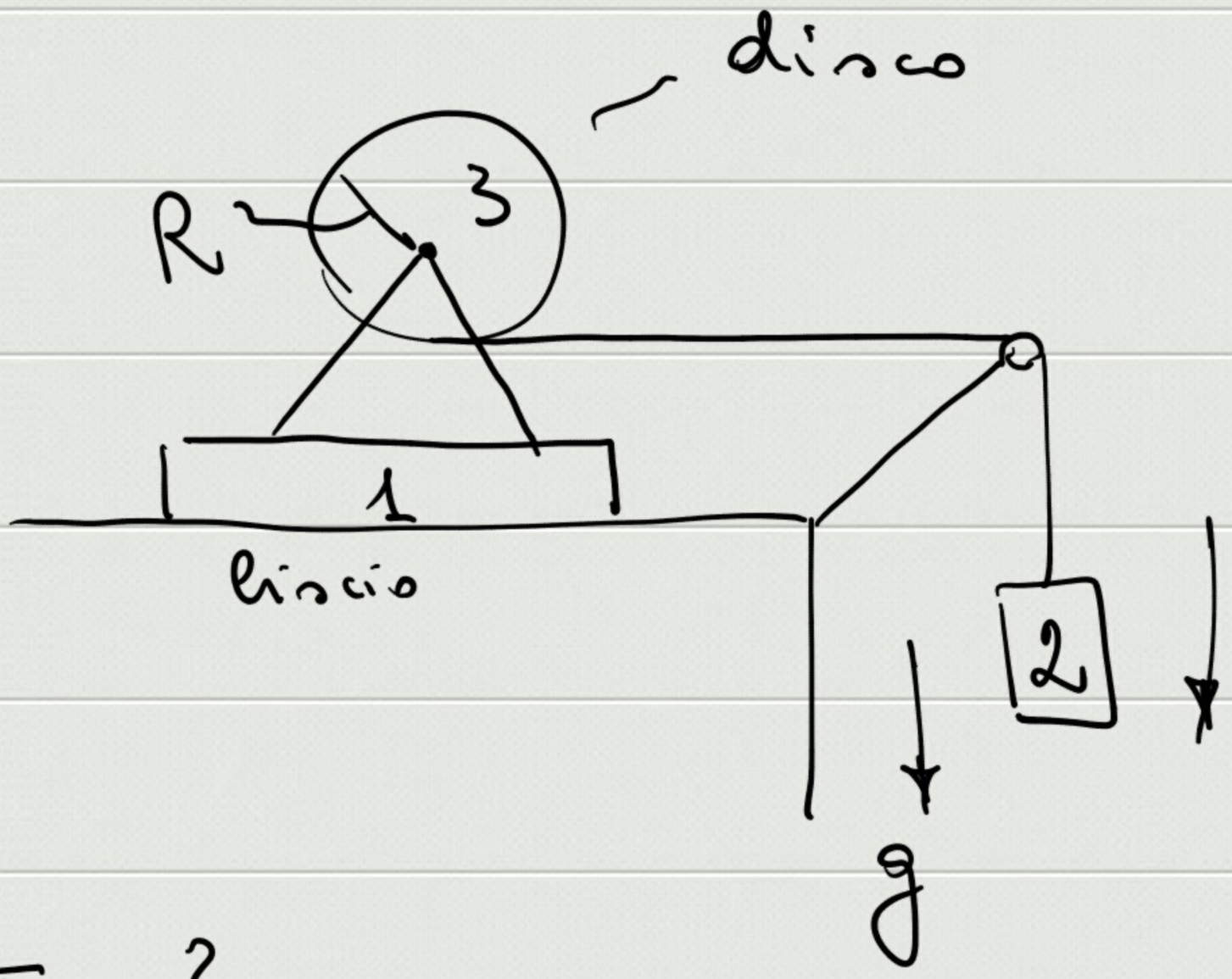



$m_1 = 2.5\,kg$

$m_2 = 1\,kg$

$m_3 = 2\,kg$

$R = 0.1\,m$

$T = ?$

$$\boxed{m_2 g - T = m_2 a_2}$$

$$\boxed{T = (m_1 + m_3) a_{13}}$$

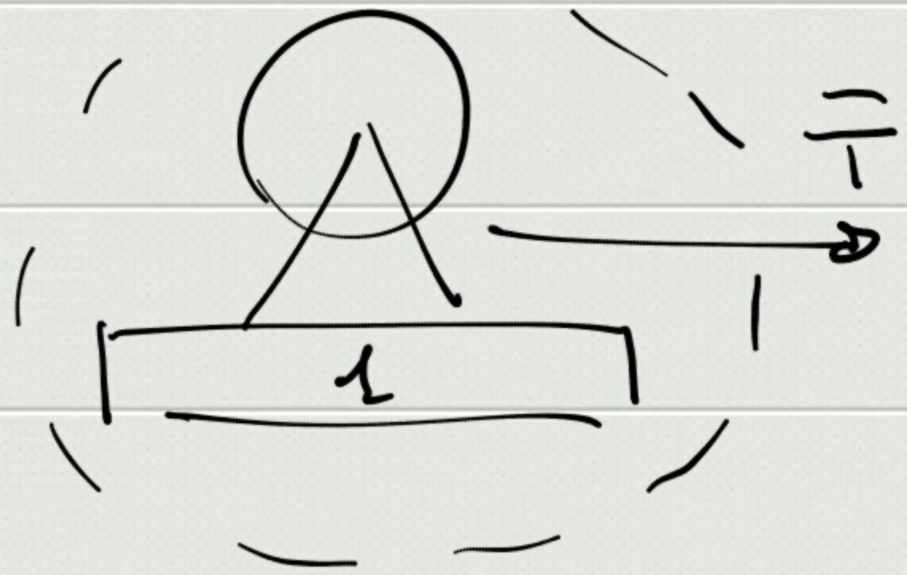
$$\begin{cases} \bar{T} + \bar{F}_{13} + m_3 \bar{g} = m_3 \bar{a}_{13} \\ \bar{F}_{31} + m_1 \bar{g} + \bar{N}_1 = m_1 \bar{a}_{13} \end{cases}$$

$\boxed{F_{13} = ?}$

$$T = (m_1 + m_3)(a_{13} + \alpha R) \qquad \alpha = \frac{a_{13}}{R}$$

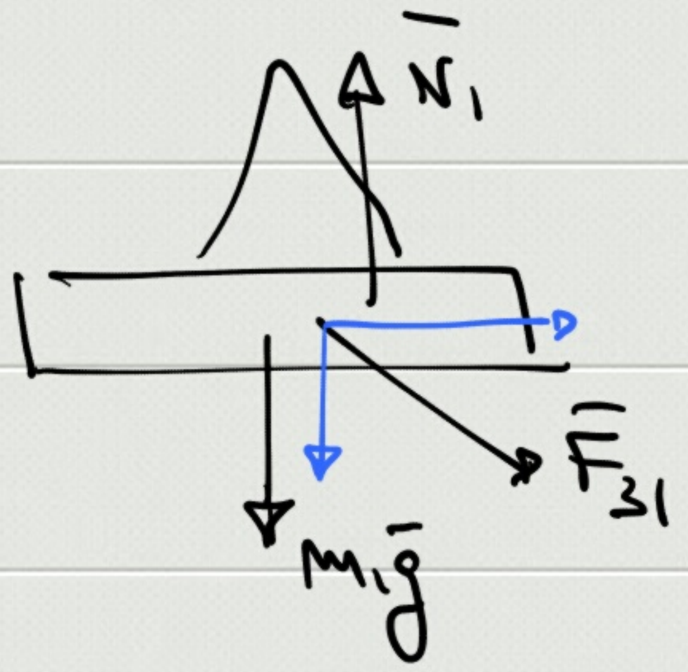
$$T = m_3 a_{13}$$

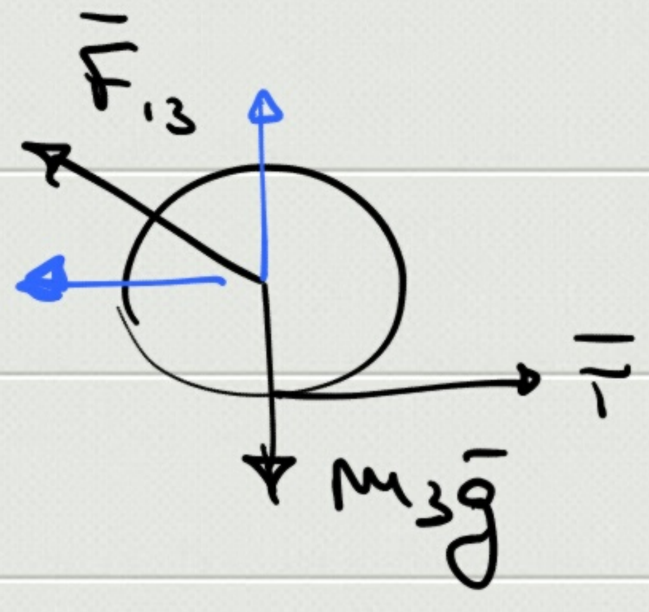
$$=$$




$$\boxed{\bar{R}^{\varepsilon} = m_{TOT}\, \bar{a}_{CM}}$$

$$\Rightarrow T = (m_1 + m_3) a_{13}$$

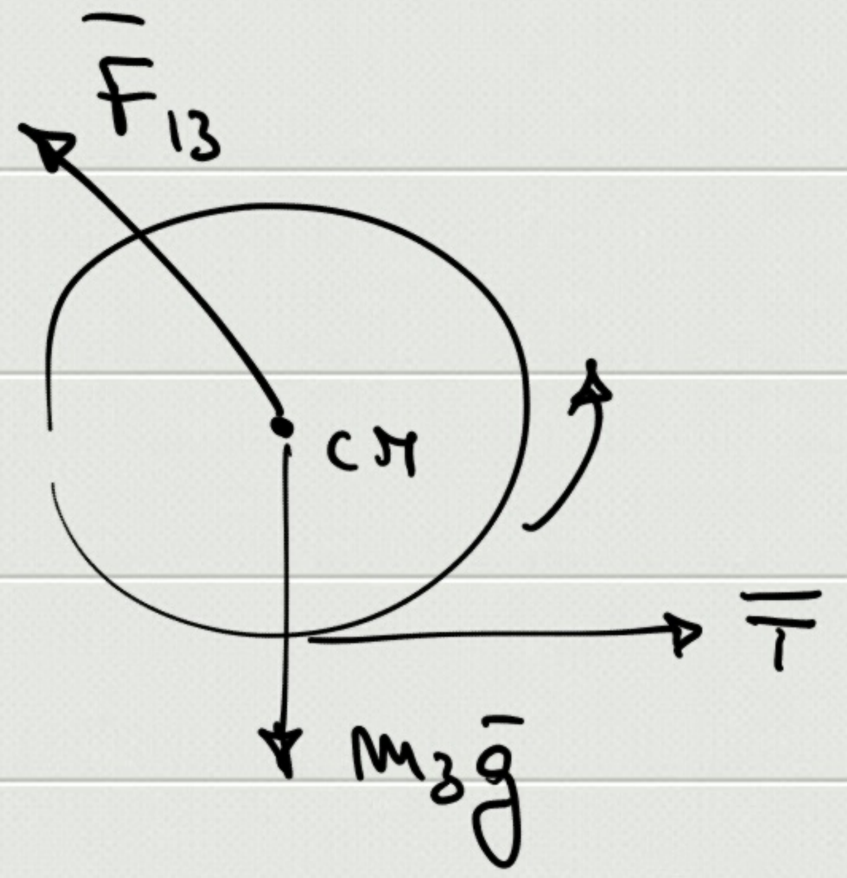



$$R T + mgR = I\alpha$$

$$R T - mgR = I\alpha$$

$$R$$




$$\bar{\Pi}^{\varepsilon}_{polo} = \bar{I}\,\bar{\alpha} \Rightarrow$$

$$R T = I\alpha$$

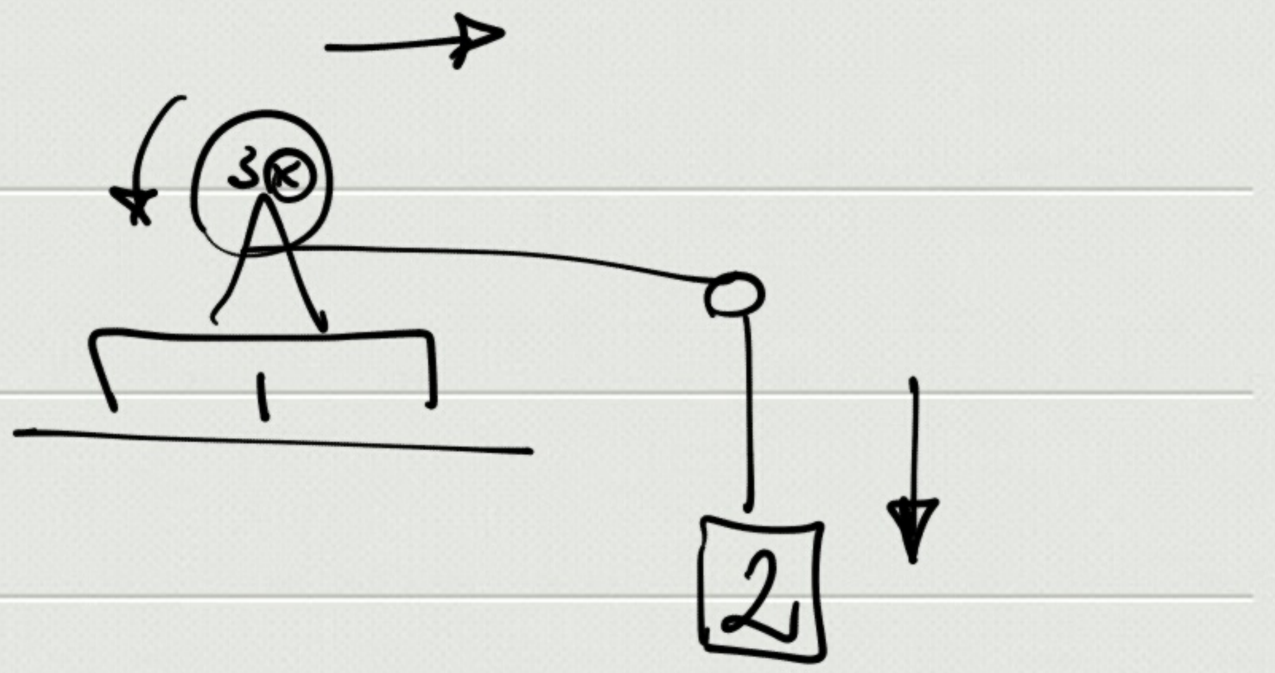
$$\hookrightarrow \frac{1}{2} m_3 R^2$$

$$a_2 = a_{13}$$

$$a_2 = \alpha R$$

$$\boxed{a_2 = a_{13} + \alpha R} \quad *$$

$$a_2 = a_{13} - \alpha R$$




$a_{13} = 0 \Rightarrow a_2 = \alpha R$

$\alpha = 0 \Rightarrow a_2 = a_{13}$

$$\begin{cases} m_2 g - T = m_2 a_2 \\ T = (m_1 + m_3) a_{13} \\ RT = \frac{1}{2} m_3 R^2 \alpha \\ a_2 = a_{13} + \alpha R = \frac{T}{m_1 + m_3} + \frac{2T}{m_3} \end{cases}$$

$$\Rightarrow m_2 g = T + \left( \frac{m_2}{m_1 + m_3} + \frac{2 m_2}{m_3} \right) T$$

$$\Rightarrow T = \frac{m_2 g}{1 + \frac{m_2}{m_1 + m_3} + \frac{2 m_2}{m_3}} = 4.5 \text{ N}$$

$$F_{13,x} = -2.5 \text{ N}$$

$$F_{13,y} = 19.6 \text{ N}$$