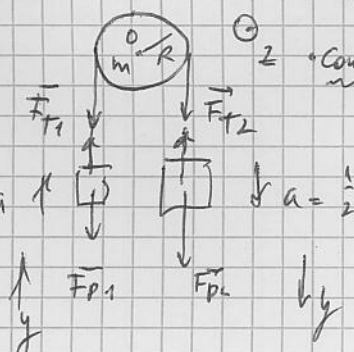
(14.59).

① Rotation :

$\Sigma \vec{M}_O = \vec{R} \times \vec{F}_{T_2} + \vec{R} \times \vec{F}_{T_1}$ (Thm. sur les moments)



• Composantes en z : $\Sigma M_O = R F_{T_2} - R F_{T_1} = I \alpha$ (loi de Newton) (1)

② . Dynamique translation : (2ème loi de Newton)

* Sur m_1, en composantes sur y : $F_{T_1} - m_1 g = m_1 a$

$\Rightarrow F_{T_1} = m_1 (a+g)$ (2)

* Sur m_2, en composantes : $m_2 g - F_{T_2} = m_2 a$

$\Rightarrow F_{T_2} = m_2 (g-a)$ (3)

En combinant (2) et (3) avec (1) :

$$R(m_2 g - m_2 a - m_1 a - m_1 g) = R\left(m_2 g - m_2 \frac{g}{2} - m_1 \frac{g}{2} - m_1 g\right) = I\alpha = I\frac{a}{R} = I\frac{g}{2R}$$

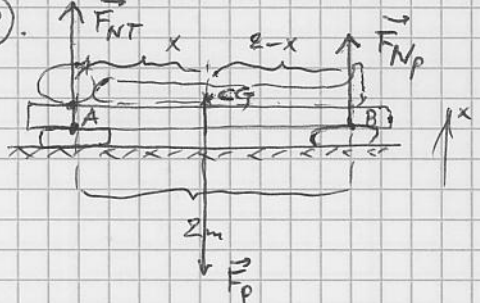
$\alpha = \frac{a}{R}$

$I = \frac{1}{2} m R^2$ (disque plat)

$$\Rightarrow g\left(\frac{m_2}{2} - \frac{3}{2} m_1\right) = \frac{1}{2} m R^2 \frac{g}{2R}$$

$$\Rightarrow \underline{\underline{m = 2(m_2 - 3m_1)}}$$

(14.48).



a). Translation : $\Sigma \vec{F} = \vec{0}$

Sur x : $F_{NT} + F_{Np} = F_p = \underline{\underline{740 N}}$

b). Rotation : $\Sigma \vec{M}_A = \vec{0}$

$M_{\curvearrowleft} = x F_p$

$M_{\curvearrowright} = 2 F_{Np}$

$\Rightarrow M_{\curvearrowright} - M_{\curvearrowleft} = x F_p - 2 F_{Np} = 0$

$$\Rightarrow x = \frac{2 F_{Np}}{F_p} = \frac{2 \cdot 315}{740} = \frac{630}{740} \overset{N}{=} \underline{\underline{0,85 m}}$$