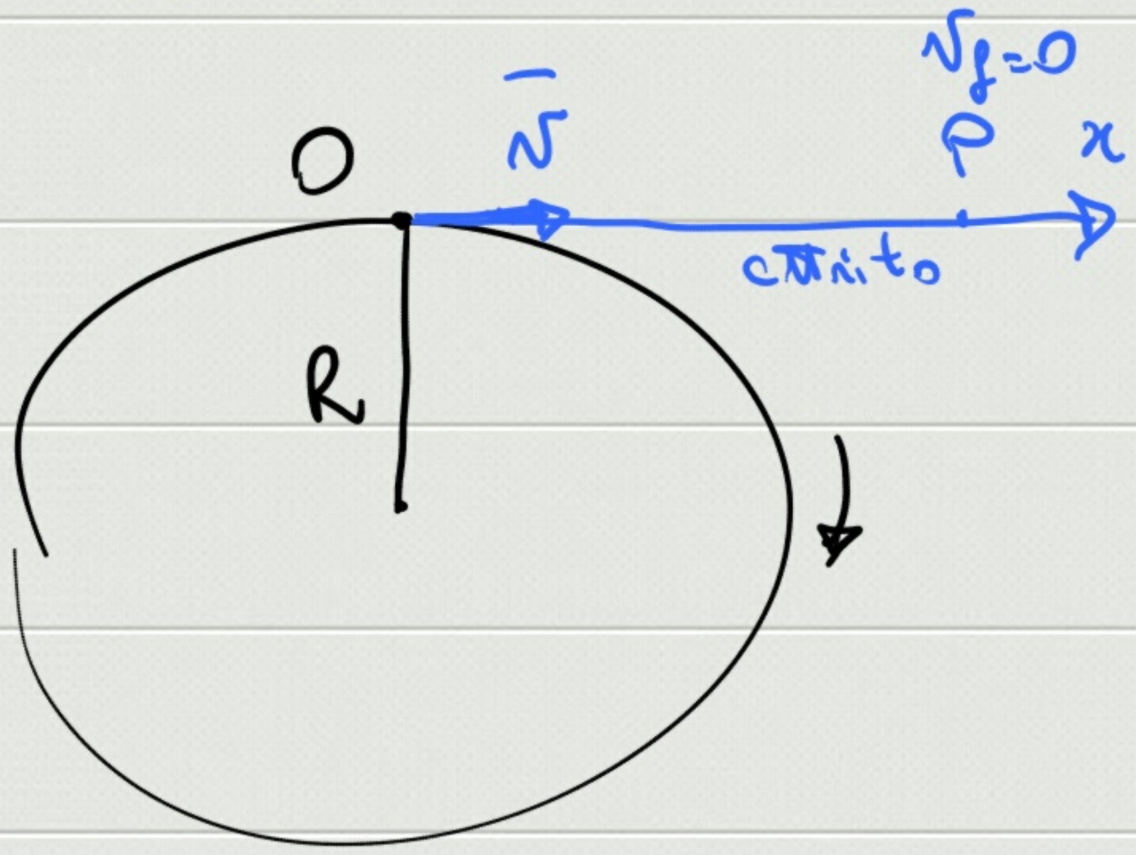


$m = 3.6\ kg$

$v_0 = 0$

$F_T = cost = 6.7\ N$

$R = 1.5\ m$

liscio

$v_f = 0 \quad OP = d = 8.4\ m$

F_N (3 gli) = ? $\quad \mu_d = ?$

- $v^2 = v_0^2 + 2 a_T \ell$ $\quad \rightarrow \ell = 6\pi R \quad a_T = \frac{F_T}{m}$

- $\omega^2 = \omega_0^2 + 2\alpha \Delta\theta$

- $\begin{cases} \ell = \frac{1}{2} a_T t^2 \\ v = a_T t \end{cases}$

- $\begin{cases} \Delta\theta = \frac{1}{2}\alpha t^2 \\ \omega = \alpha t \end{cases}$

$$v^2 = 2 \frac{F_T}{m} 6\pi R \quad \Rightarrow \quad v = \sqrt{12\pi \frac{F_T R}{m}}$$

$$F_N = m \frac{v^2}{R} = \frac{m\alpha}{R} \cdot 12\pi R \frac{F_T}{m} = 12\pi F_T = 253\ N$$

$\Delta\theta = 6\pi\ rad \qquad \alpha = \frac{a_T}{R} = \frac{F_T}{mR}$

$$\Rightarrow \quad t^2 = \frac{2\Delta\theta}{\alpha} = \frac{12\pi}{F_T} mR$$

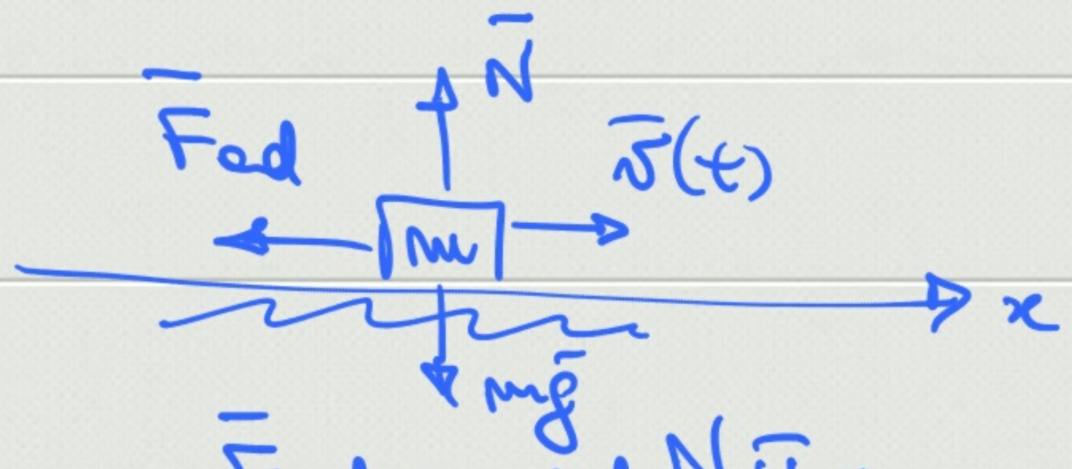
$$\omega^2 = \alpha^2 t^2 = \frac{F_T^2}{m^2 R^2} \cdot \frac{12\pi}{F_T} mR = 12\pi \frac{F_T}{mR}$$

$$F_N = m\omega^2 R = 12\pi F_T$$

$$0 = v^2 - 2\mu_d g d \quad *$$

$$0 = v^2 - 2 a_T d$$

$$0 = v^2 + 2 a_T d$$



$$\vec{F}_{ad} = -\mu_d N \vec{u}_v$$

$$\stackrel{!}{=} -\mu_d m g \vec{u}_v$$

$$\vec{F}_{ad} = m\vec{a}$$

$$\Rightarrow \boxed{a = -\mu_d g}$$

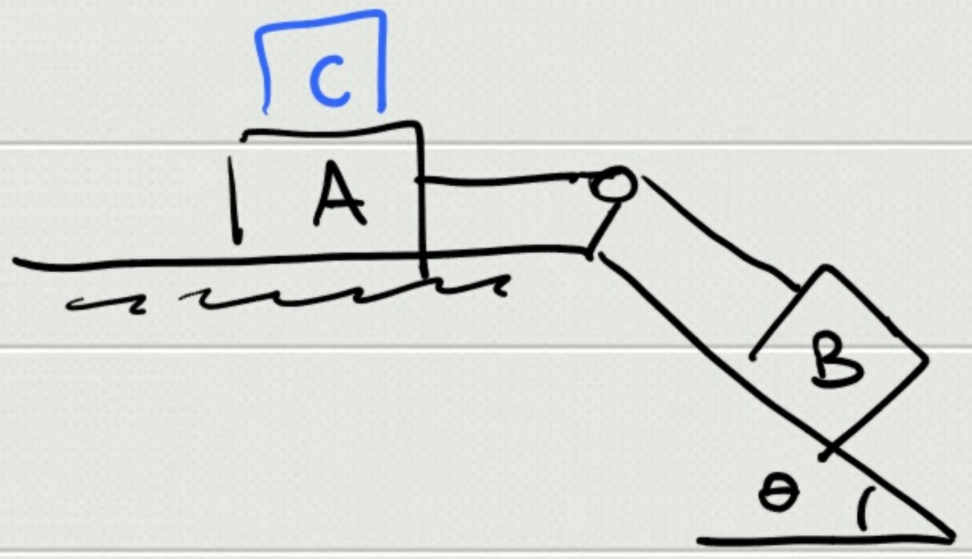
$$- \begin{cases} a = -\mu g \\ 0 = v - at \\ d = \frac{1}{2} a t^2 \end{cases} \quad *$$

$$v_f^2 = v_i^2 + 2a\Delta x \quad \rightarrow d$$

$v_f \rightarrow 0$ $\quad v_i \rightarrow v$ $\quad a \rightarrow -\mu g$

$$0 = v^2 - 2\mu g d \Rightarrow \mu_d = \frac{v^2}{2gd} = \frac{6\pi F_T R}{mgd} =$$

$$= 0.64$$



$m_A = 10\ kg$

$m_B = 6\ kg$

$\theta = 30°$

$\mu_s = 0.25 \quad \mu_d = 0.2$

$m_{C,min} = ?$: eq. statico, $T = ?$

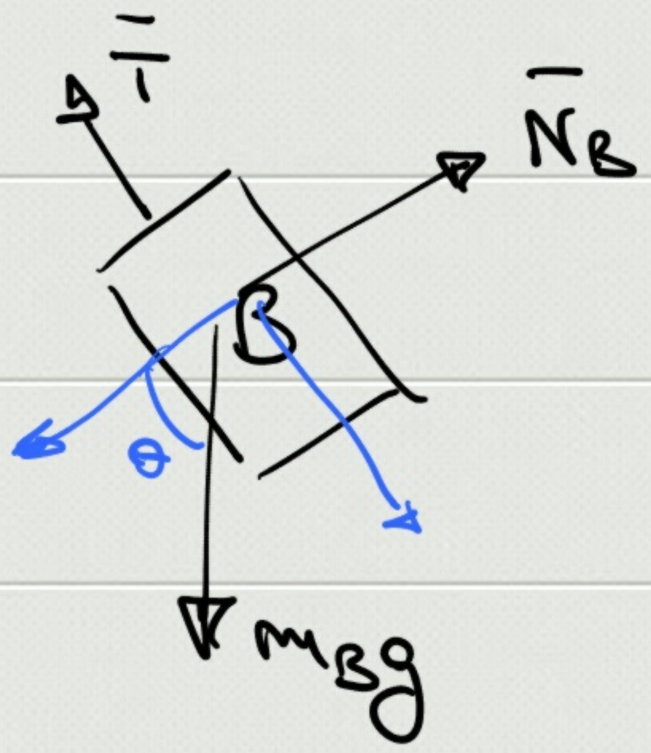
$T = m_B g \sin\theta$ *

$T - F_{es} = 0$ *

$T - F_{es} \leq \mu_s (m_A + m_C) g$

$F_{es} \leq \mu_s (m_A + m_C) g$ *

$F_{es} = \mu_s m_A g$



$T - m_B g \sin\theta = 0$

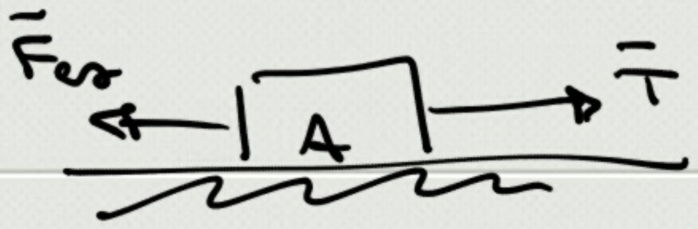
$\Rightarrow T = m_B g \sin\theta = 29.4N$

$F_{es} - T = 0 \Rightarrow F_{es} = T$

$F_{es} \leq F_{es,max} = \mu_s N_A$

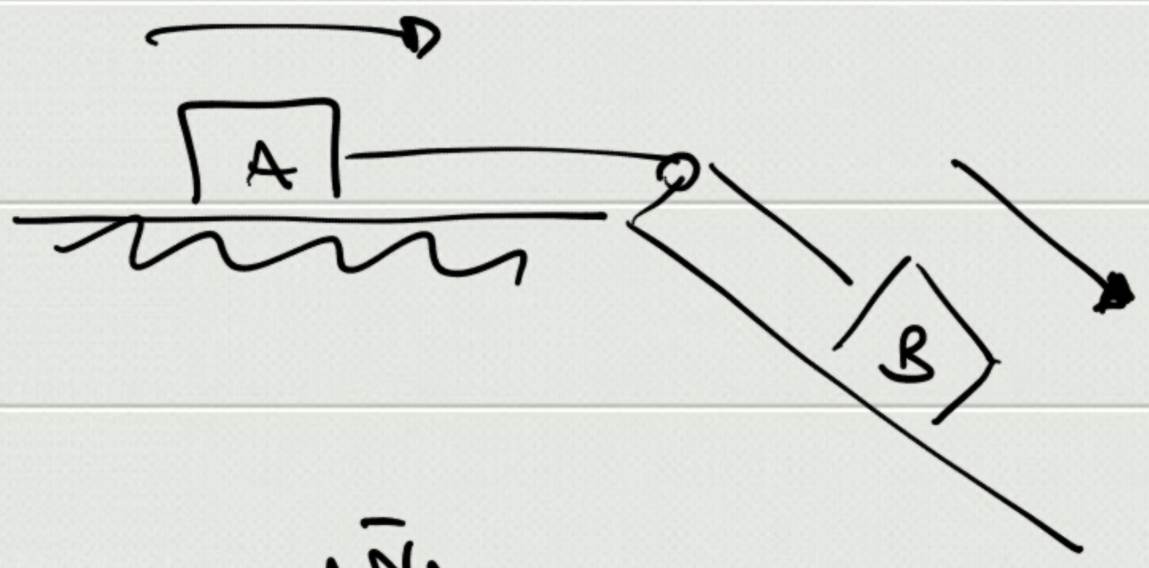
$\Rightarrow N_A = (m_A + m_C) g$

$\Rightarrow F_{es} \leq \mu_s (m_A + m_C) g$



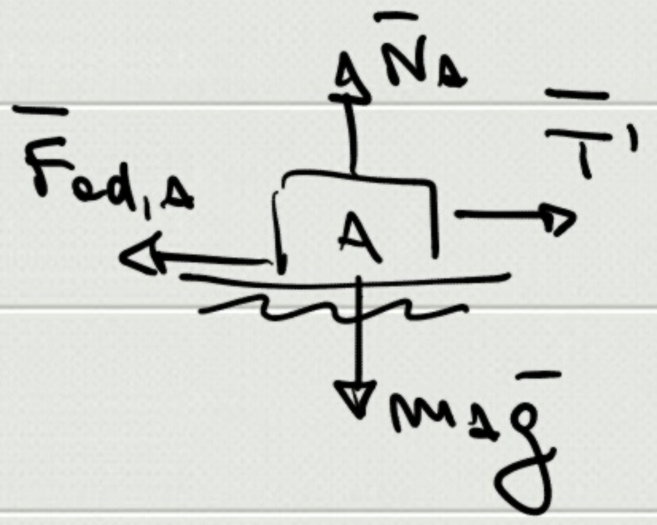
$$F_{ms} = m_B g \sin\theta \le F_{ms,max} = \mu_s (m_A + m_C) g$$

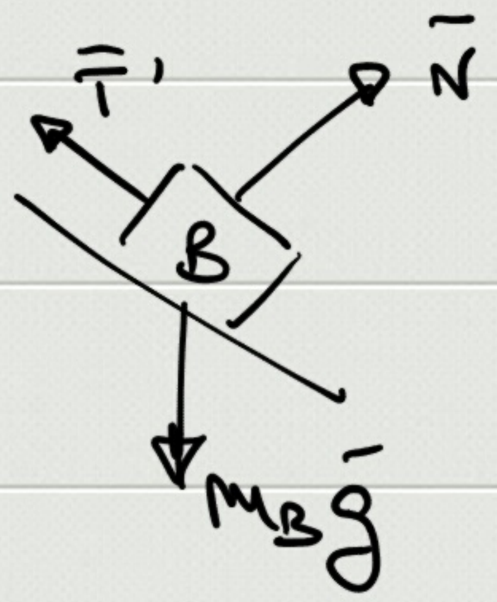
$$\Rightarrow m_C \ge \frac{m_B \sin\theta}{\mu_s} - m_A = m_{C,min} = 2\,kg$$



$a_A = ?$

$T' = ?$





$$B: \begin{cases} m_B g \sin\theta - T' = m_B a_B \\ A: \quad T' - F_{ad,A} = m_A a_A \end{cases}$$

$a_A = a_B = a$

$$\begin{cases} m_B g \sin\theta - T' = m_B a \\ T' - \mu_d m_A g = m_A a \end{cases}$$

$$(m_B \sin\theta - \mu_d m_A) g = (m_A + m_B) a$$

$$a = \frac{m_B \sin\theta - \mu_d m_A}{m_A + m_B} g = 2.45 \ m/s^2$$

$$T' = m_A a + \mu_d m_A g =$$

$$= \frac{m_A m_B}{m_A + m_B} (\sin\theta + \mu_d) g = 14.7 \text{ N}$$