

$$m = 0,4 \text{ kg}$$

$$M = 0,1 \text{ kg}$$

$$K = 200 \text{ N/m}$$

$$F = 8 \text{ N}$$

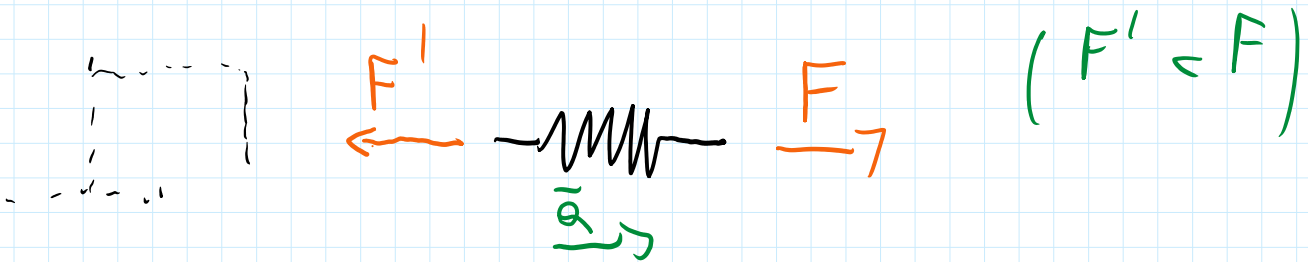
$$\sum \vec{F} = m \cdot \vec{a}$$

$$\vec{F} + \vec{F}' = M \cdot \vec{a} \rightarrow \text{BILANCIO MOLLA}$$

f. elastica

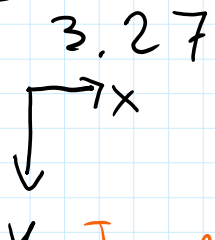
$$\vec{F} = (M + m) \cdot \vec{a} \rightarrow \text{BILANCIO SISTEMA}$$

$$\sim 8 = (0,4 + 0,1) \cdot a \sim a = \frac{8}{0,5} = 16 \text{ m/s}^2$$



$$8 - K \cdot \Delta x = 0,1 \cdot 16 \sim 8 - 200 \Delta x = 1,6$$

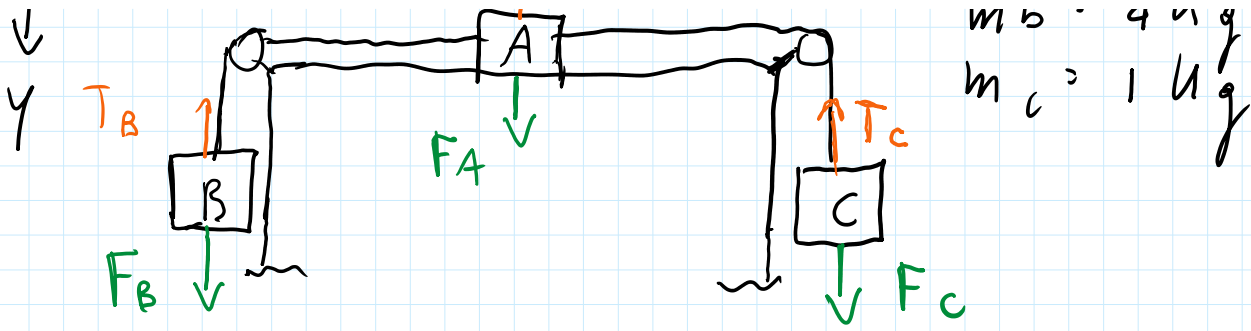
$$\sim \Delta x = 0,032 \text{ m}$$



$$m_a = 2 \text{ kg}$$

$$m_b = 4 \text{ kg}$$

$$m_c = 1 \text{ kg}$$



$$\sum \vec{F} = \sum m \cdot \vec{a} \quad \leadsto \text{BILANCIO SISTEMA}$$

Asse X  $\leadsto$  NON MI INTERESSA

$$F_B = m_B \cdot g = 39,24 \text{ N}$$

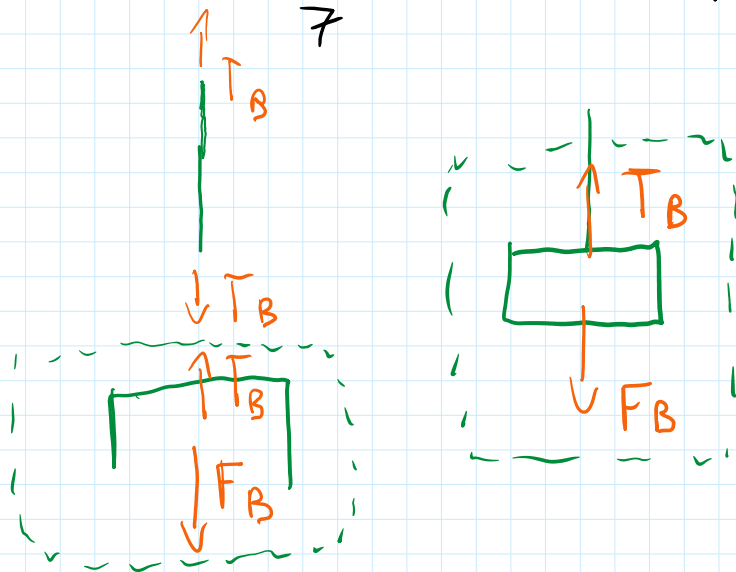
$$F_C = m_C \cdot g = 9,81 \text{ N}$$

$$\left( \begin{array}{l} F_A \approx 19,6 \text{ N} \\ N_A = -19,6 \text{ N} \end{array} \right)$$

$$F_B - F_C = (m_A + m_B + m_C) \cdot a$$

$$39,24 - 9,81 = (7) \cdot a$$

$$\leadsto a \approx \frac{30}{7} = 4,28 \text{ m/s}^2$$



funce:  
 TRAZIONE?  
 COMPRESSIONE?

$$T_B) \quad \Sigma F = m \bar{a}$$

$$F_B - T_B = m_B \cdot a \quad \sim 739,24 - T_B = 4 \cdot 4,20$$

$$m \cdot g - T_B = m \cdot a$$

$$\sim T_B = 739,24 - 16,80$$

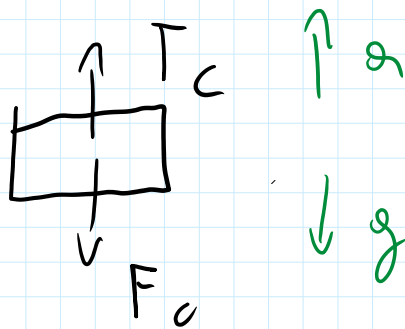
$$-T_B = m (a - g)$$

$$T_B = 22,44 \text{ N}$$

$$T_B = m (g - a)$$

$$(< 39,24)$$

Tc)



$$F_c - T_c = m \underline{a} \quad \rightarrow \quad a = -4,2 \text{ m/s}^2$$

$$9,81 - T_c = 1 \cdot (-4,20)$$

$$\sim T_c = 1 \cdot (-9,81 - 4,20)$$

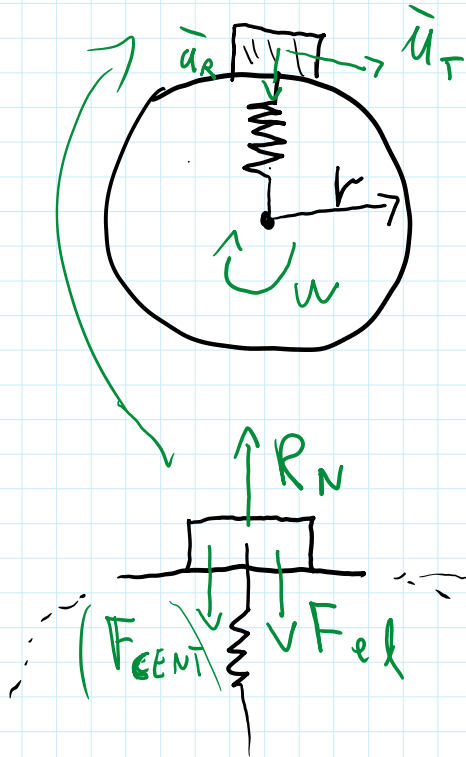
$$\sim T_c = 1 \cdot \left( \underbrace{9,81}_g + \underbrace{4,20}_a \right)$$

$$\approx 14 \text{ N}$$

( > 9,81 N  
 ↑  
 Tensione Tc nel  
 SISTEMA IN QUIETE )

$$\approx 19 \text{ N}$$

(  $> 9,81 \text{ N}$   
 ↑  
 Tensione  $T_c$  nel  
 SISTEMA IN QUIETE )



$$r_0 = 0,1 \text{ m}$$

$$r = 0,5 \text{ m}$$

$$k = 5,1 \text{ N/m}$$

$$m = 0,15 \text{ kg}$$

" (  $F_{CENT}$  ) "

$$1) \vec{R}_N + \vec{F}_{EL} = m \cdot \vec{a}$$

$$2) \vec{R}_N = 0 \sim \text{SI STACCA DAL VINCULO AL LIMITE}$$

$$1) + 2) \sim F_{EL} = m \cdot a \quad \left( \omega^2 R \right)$$

$$k \cdot \Delta x = m \cdot a_{CENT}$$

$$(r - r_0) \quad k \cdot \Delta x = m \omega^2 R$$

$$5,1 \cdot (0,5 - 0,1) = 0,15 \omega^2 \cdot 0,5$$

$$\omega = \sqrt{\frac{5,1 \cdot 0,4}{0,075}} = 5,2 \text{ rad/s}$$

$$V = 0,075$$

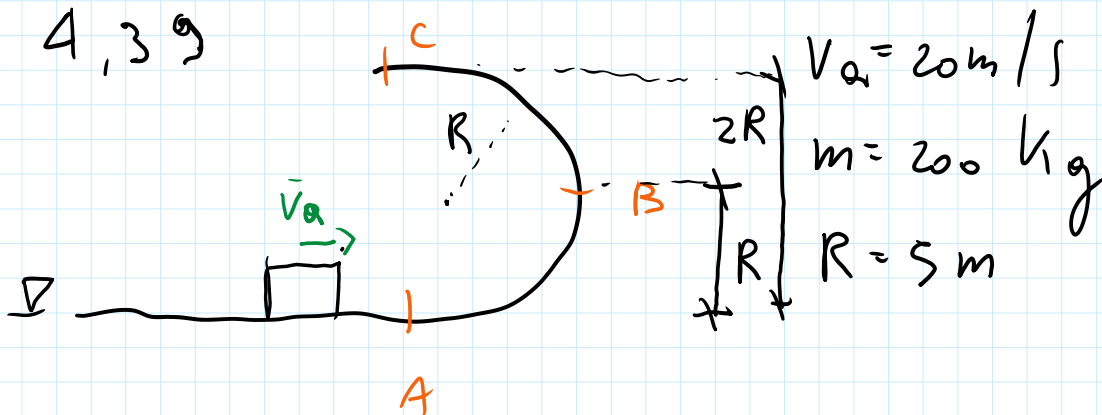
$$E_m = E_{GRAV} + E_{EL} + E_{CIN}$$

$$= \frac{1}{2} k D x^2 + \frac{1}{2} m (w_r)^2$$

$$= \frac{1}{2} \cdot 5,1 \cdot 0,4^2 + \frac{1}{2} \cdot 0,15 \cdot (2,4 \cdot 0,5)^2$$

$$= 0,52 \text{ J}$$

$$\text{con } w = 2,4 \text{ rad/s}$$



$$v_A = 20 \text{ m/s}$$

$$E_{TOT A} = E_{TOT B} = E_{TOT C}$$

$$v_B = ?$$

$$E_{TOT A} = \frac{1}{2} m v_A^2 = 40 \text{ kJ}$$

$$= 40000 \text{ J}$$

$$\text{I) } E_{TOT B} = E_{TOT A} = \frac{1}{2} m v_B^2 + m \cdot g \cdot R$$

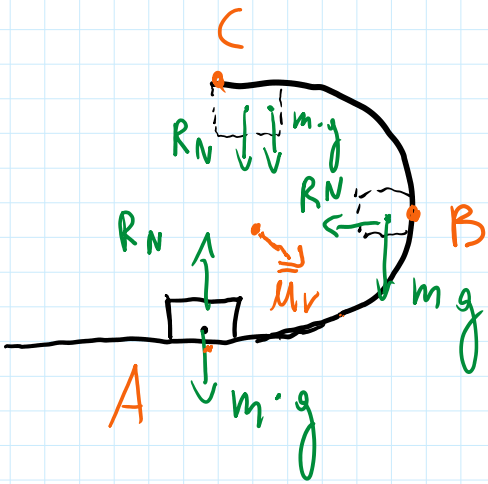
$\underbrace{40000}$        $\uparrow$  **VARIABILE UNICA**

$$\text{II) } E_{TOT C} = E_{TOT A} = \frac{1}{2} m v_C^2 + m \cdot g \cdot 2R$$

$$\text{II) } K_{TOT C} = E_{TOT A} = \frac{1}{2} m v_c^2 + m \cdot g \cdot 2R$$

40000

VARIABILE UNICA  
EQ. FORZE LUNGO  $\vec{u}_r$



$$A) R_N = m g$$

$$B) R_N = m \frac{v_B^2}{R} \quad m \cdot a_N \quad (F_{CENT})$$

$$C) R_N + m \cdot g = m \frac{v_c^2}{R}$$