

RESOLUÇÃO (EXEMPLOS)

FÍSICA I

LEIS DE NEWTON E APLIC. I e II

Exercício 1:

$F = 20 \text{ N}$

$\alpha = ?$

Em A

$F_{BA} = m_A a$

$F_{BA} - F = m_A a$

Em B

$m_B = 6 \text{ kg}$

$F_{AB} = m_B a$

$F_R = m_B a$

$-F_{AB} = m_B a$

Em sistema

$F_{BA} - F = m_A a$

$-F_{AB} = m_B a$

$-F = (m_A + m_B) a$

$-20 = (4+6) a$

$-20 = 10 a$

$\frac{-20}{10} = a$

$a = -2 \text{ m/s}^2$

Exercício 2:

$F = 40 \text{ N}$

$\alpha = ?$

Em B

$m_B = 6 \text{ kg}$

$F_{BA} = m_B a$

$F_R = m_B a$

$T_B = m_B a$

Em A

$m_A = 4 \text{ kg}$

$F = 40 \text{ N}$

$F - F_{AB} = m_A a$

$F_B = m_B a$

$F = (m_A + m_B) a$

$40 = (4+6) a$

$\frac{40}{10} = a$

$a = 4 \text{ m/s}^2$

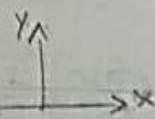
Em sistema

$F - T_{AB} = m_A a$

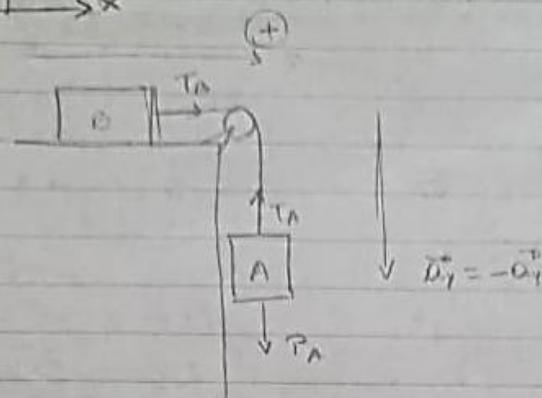
$40 - T_{AB} = 4(4)$

$40 - 16 = T_{AB}$

$T_{AB} = 24 \text{ N}$



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$$D_y^+ = -\vec{a}_y$$

$$\begin{aligned} T_B &= m_B a \\ +T_A - P_A &= -m_A a \end{aligned}$$

Em B

$$F_{Bx} = m_B a_x$$

$$F_{By} = m_B a_y$$

$$T_B = m_B a$$

$$F_{By} = 0$$

$$F_{Bz} = 0$$

$$P_A = (m_B + m_A) a$$

$$m_B g = (m_B + m_A) a$$

$$4(9,8) = (6+4) a$$

$$39,2 = 10 a$$

$$\frac{39,2}{10} = a$$

Em A

$$| T_A = T_B |$$

$$a = 3,92 \text{ m/s}^2 //$$

$$\begin{aligned} F_{Ax} &= m_A a_x && \text{não tem!} \\ F_{Ay} &= m_A a_y && \text{vinculação!} \\ +T_A - P_A &= -m_A a_y \end{aligned}$$

$$\begin{aligned} F_{Ax} &= m_A a_x && \text{não tem!} \\ F_{Ay} &= 0 && \text{em } F_z! \end{aligned}$$

$$T = ?$$

$T_A = T_B \rightarrow$ escolha 1 equação.

$$T_B = m_B a$$

Ou

$$T_A - P_A = -m_A a$$

$$T_B = 6(3,92)$$

$$T_A = P_A - m_A a$$

$$T_A = (m_A g) - m_A a$$

$$T_A = (4 \times 9,8) - (4 \times 3,92)$$

$$| T_A = 23,52 \text{ N} | //$$

$$| T_B = 23,52 \text{ N} | //$$