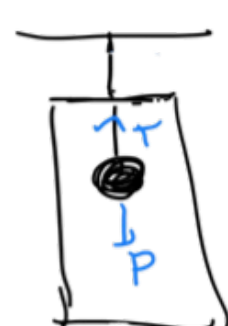


pàg. 148

6)



$$m = 1,55 \text{ kg}$$

$$\Sigma F = ma$$

$$T - P = ma$$

$$T = ma + mg$$

$$T = m(a + g)$$

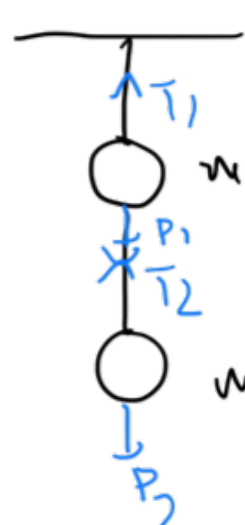
a) baixa $a = -2 \text{ m/s}^2$ $T = 1,55(-2 + 9,8) = [12,09 \text{ N}]$

b) puja $v = \text{cte} \rightarrow a = 0 \text{ m/s}^2$ $T = 1,55(0 + 9,8) = [15,19 \text{ N}]$

c) puja $a = 0,9 \text{ m/s}^2$ $T = 1,55(0,9 + 9,8) = [16,58 \text{ N}]$

d) baixa $a = -9,8 \text{ m/s}^2$ $T = 1,55(-9,8 + 9,8) = [0 \text{ N}]$

8)



$$m_1 = 2,3 \text{ kg}$$

$$m_2 = 1,6 \text{ kg}$$

$$\Sigma F = m \cdot a$$

$$T_1 - P_1 - T_2 = m_1 a$$

$$T_2 - P_2 = m_2 a$$

$$[T_2 = m_2(a + g)]$$

$$T_1 = m_1 a + m_1 g + m_2(a + g)$$

$$[T_1 = (m_1 + m_2) \cdot (a + g)]$$

a) puja $a = 1,1 \text{ m/s}^2$

$$T_1 = (2,3 + 1,6) \cdot (1,1 + 9,8) = [42,57 \text{ N}]$$

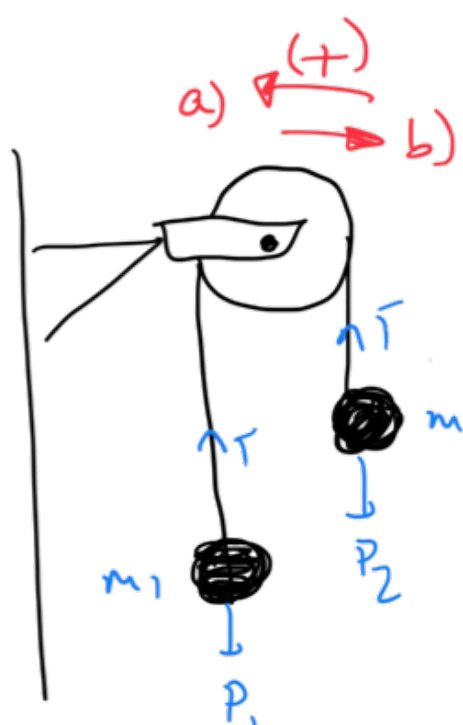
$$T_2 = 1,6 \cdot (1,1 + 9,8) = [17,44 \text{ N}]$$

b) velocitat $\text{cte} \rightarrow a = 0 \text{ m/s}^2$

$$T_1 = (2,3 + 1,6) \cdot (0 + 9,8) = [38,22 \text{ N}]$$

$$T_2 = 1,6 \cdot (0 + 9,8) = [15,68 \text{ N}]$$

11)



a) $23 \text{ g} \cdot \frac{1 \text{ kg}}{10^3 \text{ g}} = 0,023 \text{ kg}$

$15 \text{ g} \cdot \frac{1 \text{ kg}}{10^3 \text{ g}} = 0,015 \text{ kg}$

$$\left. \begin{array}{l} P_1 - T = m_1 a \\ T - P_2 = m_2 a \end{array} \right\} T = m_2(a + g)$$

$$P_1 - P_2 = a(m_1 + m_2)$$

$$m_1 g - m_2 g = a(m_1 + m_2)$$

$$g(m_1 - m_2) = a(m_1 + m_2)$$

$$a = \frac{g(m_1 - m_2)}{(m_1 + m_2)} = \frac{9,8(0,023 - 0,015)}{(0,023 + 0,015)} = [2,06 \text{ m/s}^2]$$

$$T = 0,015(2,06 + 9,8) = [0,18 \text{ N}]$$

b) $\left. \begin{array}{l} T - P_1 = m_1 a \\ P_2 - T = m_2 a \end{array} \right\} T = m_1(a + g)$

$$m_2 g - m_1 g = a(m_1 + m_2)$$

$$g(m_2 - m_1) = a(m_1 + m_2)$$

$$a = \frac{g(m_2 - m_1)}{(m_1 + m_2)} = \frac{9,8(7,9 - 5,6)}{(7,9 + 5,6)} = [1,67 \text{ m/s}^2]$$

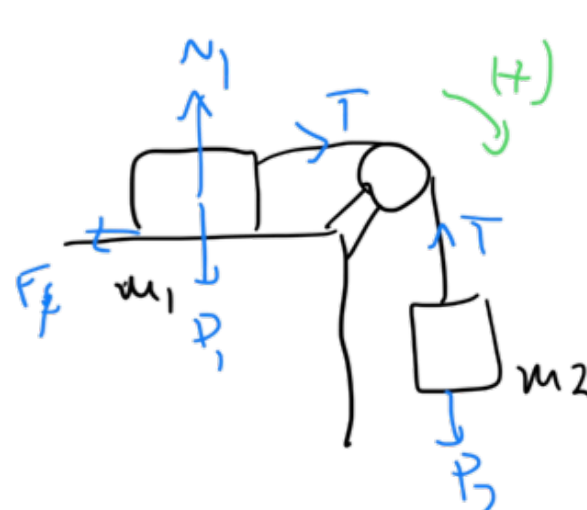
$$T = 5,6(1,67 + 9,8) = [64,23 \text{ N}]$$

pàg. 150

23)

$$m_1 = 40 \text{ kg}$$

$$\mu = 0,2$$



a) $m_2 = 10 \text{ kg}$ $a?$

$$P_2 - T = m_2 a$$

$$T - F_f = m_1 a$$

$$P_2 - F_f = a(m_1 + m_2)$$

$$m_2 g - \mu m_1 g = a(m_1 + m_2)$$

$$a = \frac{m_2 g - \mu m_1 g}{(m_1 + m_2)} = \frac{10 \cdot 9,8 - 0,2 \cdot 40 \cdot 9,8}{(40 + 10)} = [0,39 \text{ m/s}^2]$$

b) Repos $\rightarrow a = 0 \text{ m/s}^2$

$$P_2 - F_f = 0 \rightarrow P_2 = F_f$$

$$m_2 g = \mu m_1 g$$

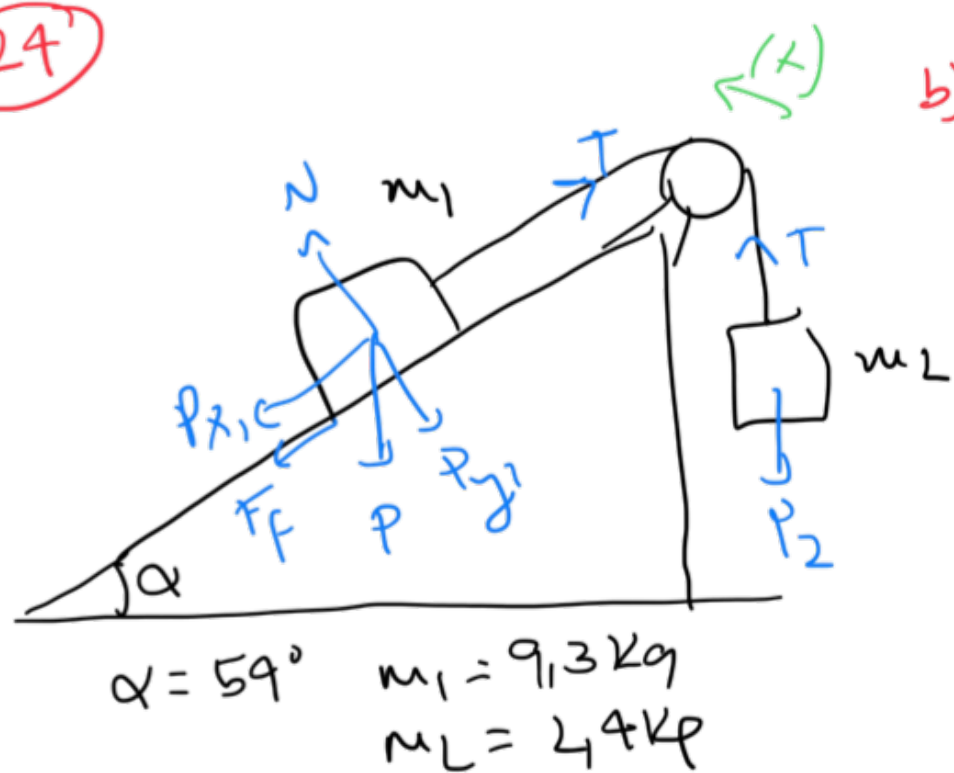
$$m_2 = 0,2 \cdot 40 = [8 \text{ kg}]$$

c) $m_2 = 6 \text{ kg} < 8 \text{ kg} \rightarrow a = 0 \text{ m/s}^2$

$$P_2 = F_f = 6 \cdot 9,8 = [58,8 \text{ N}]$$

$$T = F_f = 6 \cdot 9,8 = [58,8 \text{ N}]$$

24)



$$\alpha = 59^\circ$$

$$m_1 = 9,3 \text{ kg}$$

$$m_2 = 2,4 \text{ kg}$$

$$\left. \begin{array}{l} P_{1x} - T - F_{f1} = m_1 a \\ T - P_2 = m_2 a \end{array} \right\} T = m_2(a + g)$$

$$m_1 g \sin \alpha - \mu m_1 g \cos \alpha - m_2 g = a(m_1 + m_2)$$

$$a = \frac{9,3 \cdot 9,8 \sin 59^\circ - 0,37 \cdot 9,3 \cdot 9,8 \cos 59^\circ - 2,4 \cdot 9,8}{(9,3 + 2,4)}$$

$$a = [2,6 \text{ m/s}^2]$$

$$T = 2,4(2,6 + 9,8) = [29,75 \text{ N}]$$

u)

$$a = \frac{9,3 \cdot 9,8 \sin 59^\circ - 2,4 \cdot 9,8}{(9,3 + 2,4)} = [4,3 \text{ m/s}^2]$$

$$T = 2,4(4,3 + 9,8) = [33,8 \text{ N}]$$