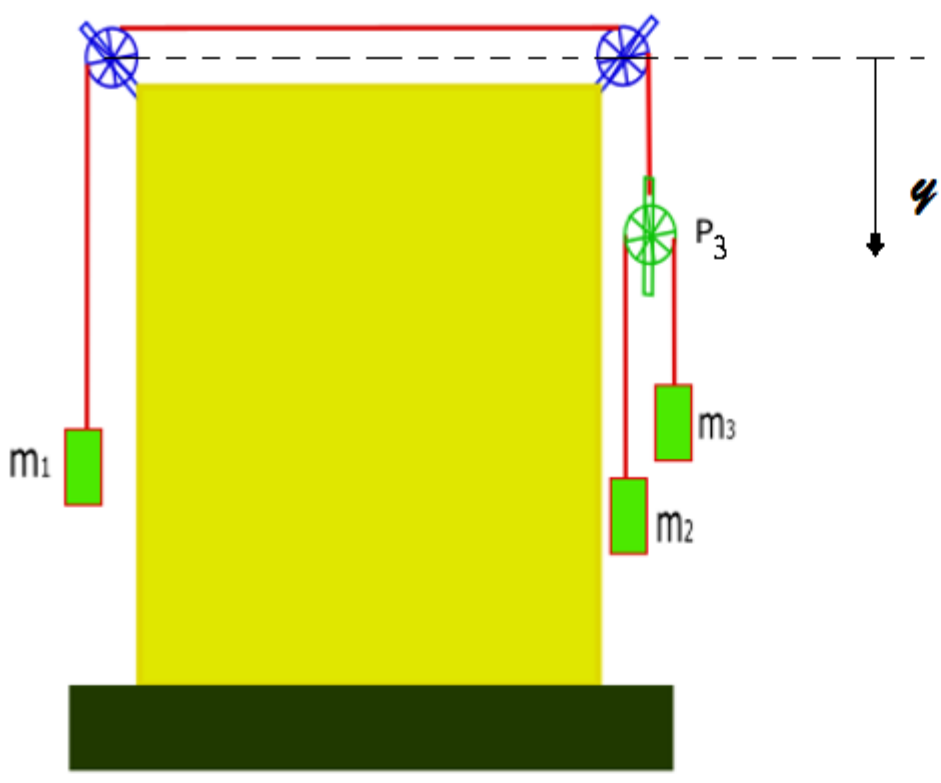
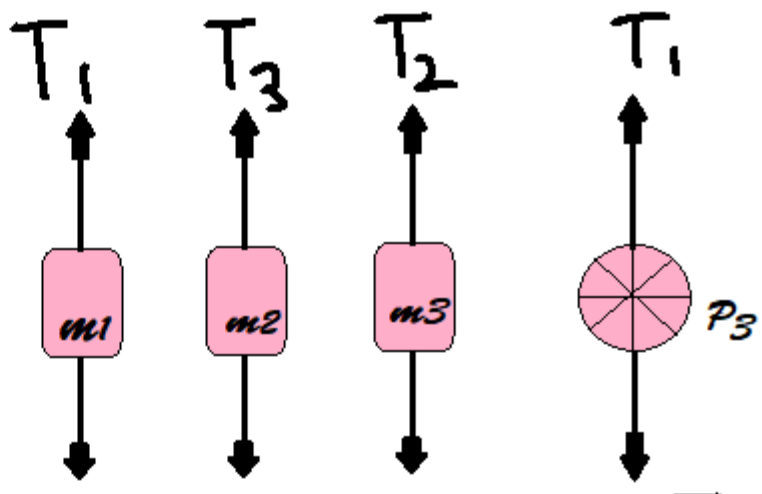




$m_1 g \quad m_2 g \quad m_3 g \qquad T_{P_3} = T_2 + T_3$

$$T_1 = -m_1 a_1 + m_1 g \quad (1)$$

$$T_2 = -m_2 a_2 + m_2 g \quad (2)$$

$+\sum F_y = m a_{P_3}$

$$T_2 + T_3 - T_1 = \cancel{m}^{0} a_{P_3}$$

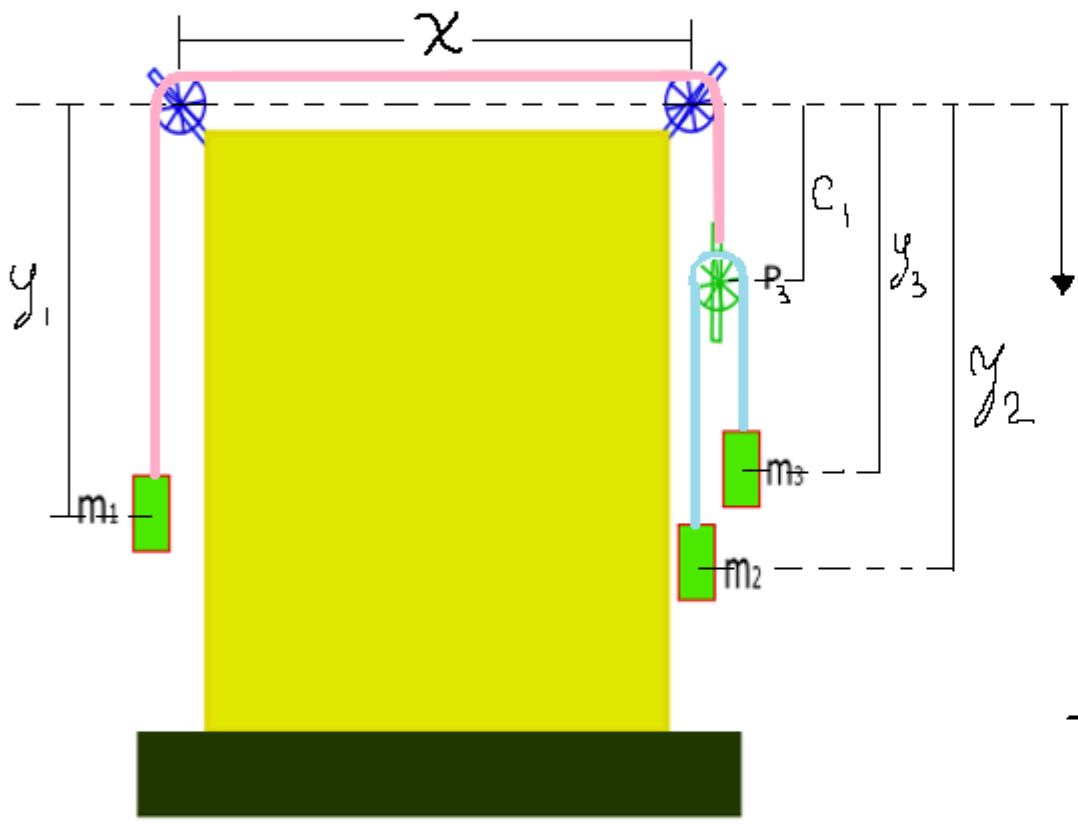
$$T_1 = T_2 + T_3 \quad (5)$$

Reemplazando (4) en (5)

$$T_1 = 2T_2 \quad (6)$$

$$T_3 = -m_3 a_3 + m_3 g \quad (3)$$

$$T_2 = T_3 \quad (4)$$



l_1 y l_2 son Cte

$$l_1 = y_1 + \pi R + c_1 + x \quad (7)$$

$$l_2 = (y_2 - c_1) + \pi R + (y_3 - c_1)$$

$$l_2 = y_2 + y_3 + \pi R - 2c_1 \quad (8)$$

derivando (7) y (8) 2 veces

$$\frac{\partial^2 l_1}{\partial t^2} = y_1'' + C_1'' = Cte \Rightarrow a_1 = -a_{P_3} \quad (9)$$

$$\frac{\partial^2 l_2}{\partial t^2} = y_2'' + y_3'' - 2C_1'' \Rightarrow$$

$$\Rightarrow 2a_{P_3} = a_2 + a_3 \quad (10)$$

Reemplazando (9) en (10)

$$-2a_1 = a_2 + a_3 \quad (11)$$

obtenemos las aceleraciones a1, a2 y a3 de las primeras 3 escuaciones respectivamente

$$a_1 = -\left(\frac{T_1 - m_1 g}{m_1}\right) = \left(\frac{2T_2 - m_1 g}{m_1}\right)$$

$$a_2 = -\left(\frac{T_2 - m_2 g}{m_2}\right)$$

$$a_3 = -\left(\frac{T_2 - m_3 g}{m_3}\right)$$

Reemplazando a1, a2 y a3 en (8)

$$2\left(\frac{2T_2 - m_1 g}{m_1}\right) = -\frac{T_2 - m_2 g}{m_2} - \frac{T_2 - m_3 g}{m_3}$$

$$\frac{4T_2}{m_1} - 2g = -\frac{T_2}{m_2} + g - \frac{T_2}{m_3} + g$$

$$T_2\left(\frac{4}{m_1} + \frac{1}{m_2} + \frac{1}{m_3}\right) = 4g$$

$$T_2 = \left[\frac{4m_1 \cdot m_2 \cdot m_3}{4m_2 m_3 + m_1 m_3 + m_1 m_2}\right] g$$

$$T_1 = \left[\frac{8m_1 \cdot m_2 \cdot m_3}{4m_2 m_3 + m_1 m_3 + m_1 m_2}\right] g$$

$$a_1 = -\frac{T_1}{m_1} + g$$

$$a_2 = -\frac{T_2}{m_2} + g$$

$$a_3 = -\frac{T_3}{m_3} + g$$

$$\begin{cases} y_1 = y_{01} + \frac{1}{2} a_1 t^2 \\ y_2 = y_{02} + \frac{1}{2} a_2 t^2 \\ y_3 = y_{03} + \frac{1}{2} a_3 t^2 \end{cases}$$