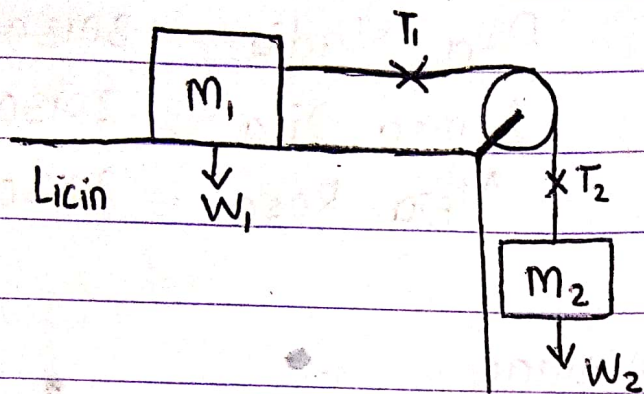


## ⇒ Persamaan Mekanika Newtonian



Massa katrol diabaikan  
dan bidang datar licin

Tinjau Benda I

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

$$T_1 = m_1 \cdot a$$

$$T = m_1 \cdot a$$

Tinjau Benda II

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

$$W_2 - T_2 = m_2 \cdot a$$

$$T_2 = W_2 - m_2 \cdot a$$

$$T = W_2 - m_2 \cdot a$$

karena tegang tali sama besar, maka :

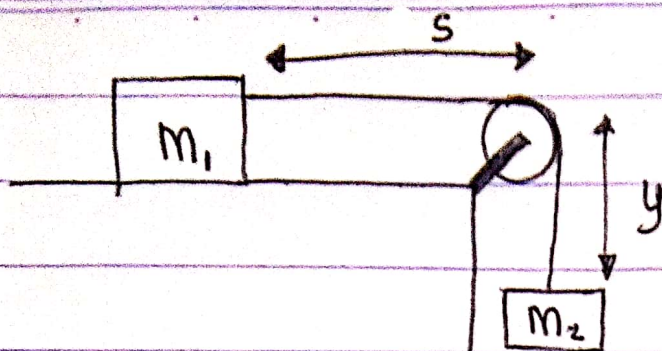
$$m_1 \cdot a = W_2 - m_2 \cdot a$$

$$m_1 \cdot a + m_2 \cdot a = W_2$$

$$a = W_2 / m_1 + m_2$$

|                             |
|-----------------------------|
| $a = \frac{W_2}{m_1 + m_2}$ |
|-----------------------------|





⇒ Persamaan Mekanika Lagrangian

$$T = \frac{1}{2} m_1 \dot{x}_1^2 + \frac{1}{2} m_2 \dot{y}_2^2$$

$$V = m_1 g y_1 + m_2 g y_2$$

$$\dot{x}_1 = \frac{dx_1}{dt}$$

$$x_1 = s \rightarrow \dot{x}_1 = -\dot{s}$$

$$y_2 = -(l-s) \rightarrow \dot{y}_2 = \dot{s}$$

$$T = \frac{1}{2} m_1 (-\dot{s})^2 + \frac{1}{2} m_2 \dot{s}^2 = \frac{1}{2} (m_1 + m_2) \dot{s}^2$$

$$V = m_2 g (s-l)$$

$$L = \frac{1}{2} (m_1 + m_2) \dot{s}^2 - m_2 g (s-l)$$

$$\frac{\partial L}{\partial s} - \frac{d}{dt} \frac{\partial L}{\partial \dot{s}} = 0$$

$$\frac{\partial L}{\partial s} = -m_2 g$$

$$\frac{\partial L}{\partial \dot{s}} = \frac{2}{2} (m_1 + m_2) \dot{s}$$

$$\frac{d}{dt} \frac{\partial L}{\partial \dot{s}} = (m_1 + m_2) \ddot{s}$$

$$-m_2 g - (m_1 + m_2) \ddot{s} = 0$$

$$\ddot{s} = - \frac{m_2 g}{m_1 + m_2}$$