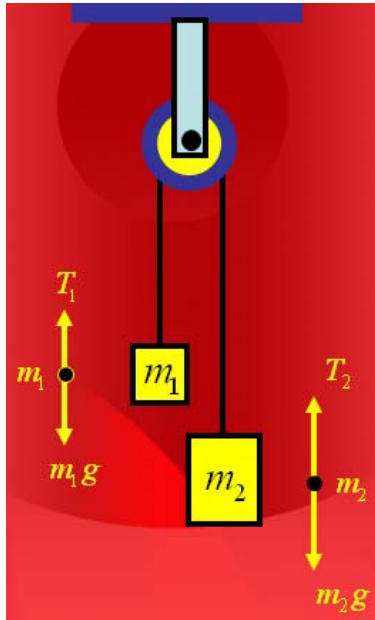


There is an error in video lecture # 6 (video recording at 41:00) please consider the following problem with correct solution.

Consider two bodies of unequal masses m_1 and m_2 connected by the ends of a string, which passes over a frictionless pulley as shown in the diagram.



$$m_2 > m_1$$

$$T - m_1g = m_1a$$

$$m_2g - T = m_2a$$

$$m_2g - m_1g = (m_1 + m_2)a$$

$$a = \frac{(m_2 - m_1)}{(m_1 + m_2)} g$$

$$m_2 > m_1$$

$$T - m_1g = m_1a$$

$$a = \frac{T - m_1g}{m_1} \quad (i)$$

$$m_2g - T = m_2a$$

$$a = \frac{m_2g - T}{m_2} \quad (ii)$$

equating (i) and (ii)

$$\frac{T - m_1g}{m_1} = \frac{m_2g - T}{m_2}$$

$$m_2T - m_1m_2g = m_1m_2g - m_1T$$

$$m_2T + m_1T = m_1m_2g + m_1m_2g$$

$$T(m_2 + m_1) = 2m_1m_2g$$

$$T = \frac{2m_1m_2g}{(m_2 + m_1)}$$