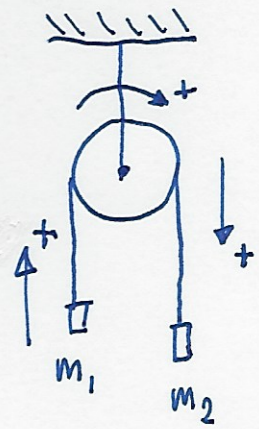
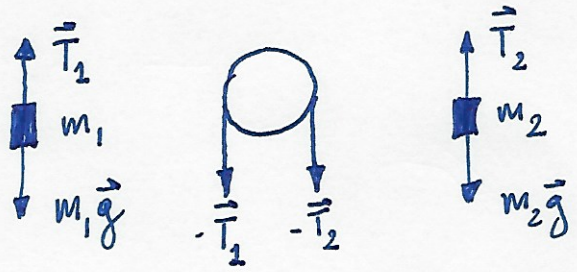
10





DIAGRAMMI DI CORPO LIBERO

SCRIVIAMO LA I E II EQ CARDINALE PER I 3 CORPI E LA CONDIZIONE DI ROTOLAMENTO. I VERSI POSITIVI SONO INDICATI IN FIGURA

$$\begin{cases} T_1 - m_1 g = m_1 a & T_1 = m_1 a + m_1 g \\ (T_2 - T_1)R = \frac{1}{2} m R^2 \alpha & \\ -T_2 + m_2 g = m_2 a & T_2 = m_2 g - m_2 a \\ a = \alpha R & \end{cases}$$

SOSTITUIAMO NELLA SECONDA EQ

$$m_2 g - m_2 a - m_1 a - m_1 g = \frac{m_2}{2} a \qquad a\left(\frac{m}{2} + m_2 + m_1\right) = g(m_2 - m_1)$$

$$a = g\,\frac{(m_2 - m_1)}{\left(\frac{m}{2} + m_2 + m_1\right)} \qquad \alpha = \frac{g}{R}\,\frac{(m_2 - m_1)}{\left(\frac{m}{2} + m_2 + m_1\right)}$$

$$\frac{T_1}{T_2} = \frac{\dfrac{m_1 g (m_2 - m_1)}{\frac{m}{2} + m_2 + m_1} + m_1 g}{m_2 g - \dfrac{m_2 g (m_2 - m_1)}{\left(\frac{m}{2} + m_2 + m_1\right)}} =$$

$$= \frac{m_1}{m_2}\,\frac{m_2 - m_1 + \frac{m}{2} + m_2 + m_1}{\frac{m}{2} + m_2 + m_1 - m_2 + m_1} = \frac{m_1}{m_2}\,\frac{\left(\frac{m}{2} + 2m_2\right)}{\left(\frac{m}{2} + 2m_1\right)}$$