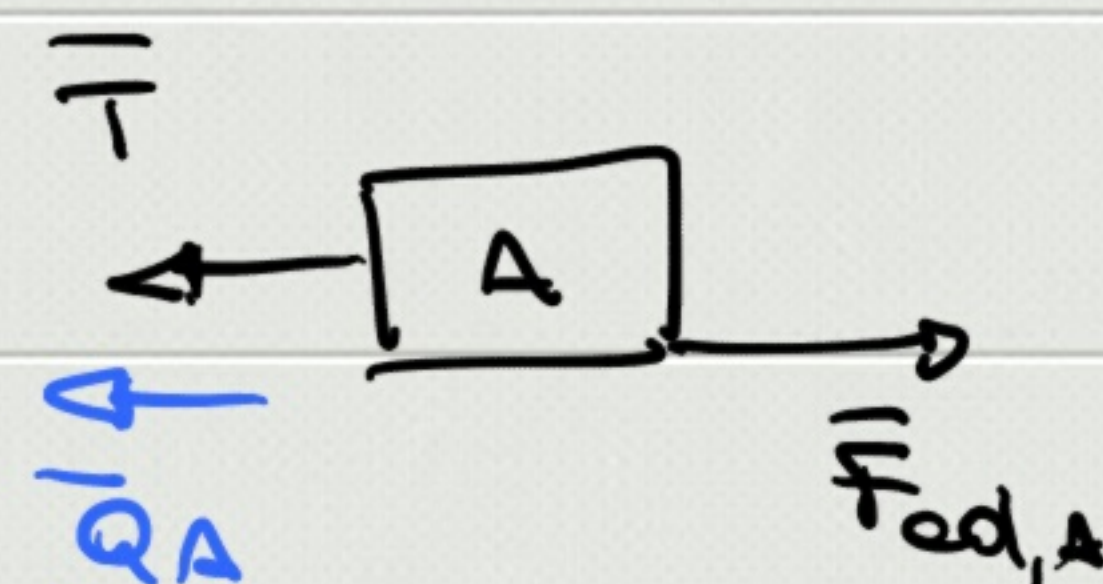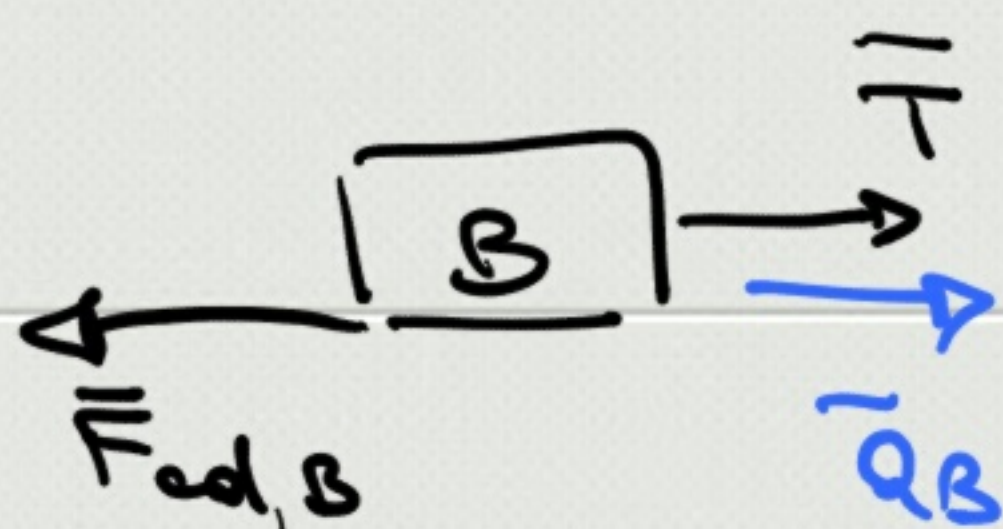$$m_A = 48 \ kg$$

$$m_B = 40 \ kg$$

$$v_{oA} = v_{oB} = 0 \qquad \mu = 0.2$$

$$a_{cm} = ?$$

$$\bar{R}^E = m_{TOT} \ \bar{a}_{cm} \qquad *$$

$$\bar{a}_{cm} = \frac{m_A \ \bar{a}_A + m_B \ \bar{a}_B}{m_A + m_B} \qquad *$$

$$\begin{cases} \mu \, m_A \, g - T = m_A \, a_A \\ T - \mu \, m_B \, g = m_B \, a_B \end{cases}$$

$$\cancel{a_{cm} = 0}$$

$$\cancel{a_{cm} = a_A - a_B}$$

$$a_{cm} = \frac{(\mu \, m_A \, g - \cancel{T}) + (\cancel{T} - \mu \, m_B \, g)}{m_A + m_B} = \frac{m_A - m_B}{m_A + m_B} \, \mu g = 0.18 \ m/s^2$$

$$\left. \begin{array}{l} R^E = \mu \, m_A \, g - \mu \, m_B \, g \\ \ \\ = (m_A + m_B) \, a_{cm} \end{array} \right\} \Rightarrow a_{cm} = \frac{m_A - m_B}{m_A + m_B} \, \mu g$$

$$a_B = 2a_A \qquad T = ?$$

$$\begin{cases} \mu m_A g - T = m_A a_A \\[6pt] T - \mu m_B g = m_B \cdot 2a_A \end{cases} \qquad\qquad \begin{cases} \mu m_A g - T = m_A a_A \\[6pt] 2T - \mu m_B g = m_B \cdot 2a_A \end{cases}$$

$$\begin{cases} \mu m_A g - 2T = m_A a_A \\[6pt] T - \mu m_B g = - m_B \cdot 2a_A \end{cases} \qquad\qquad \begin{cases} \mu m_A g - T = m_A a_A \\[6pt] T - \mu m_B g = - m_B \cdot 2a_A \end{cases} *$$

$$\overline{\quad \mu g (m_A - m_B) = a_A (m_A - 2m_B) \quad}$$

$$\Rightarrow a_A = \mu g \, \frac{m_A - m_B}{m_A - 2m_B}$$

$$\Rightarrow T = \mu g \, m_A \left(1 - \frac{m_A - m_B}{m_A - 2m_B} \right) =$$

$$= \mu g \, m_A \, \frac{\cancel{m_A} - 2m_B - \cancel{m_A} + m_B}{m_A - 2m_B} = \mu g \, m_A \, \frac{m_B}{2m_B - m_A} \approx$$

$$= 118 \ N$$