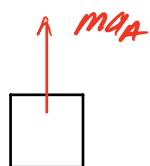
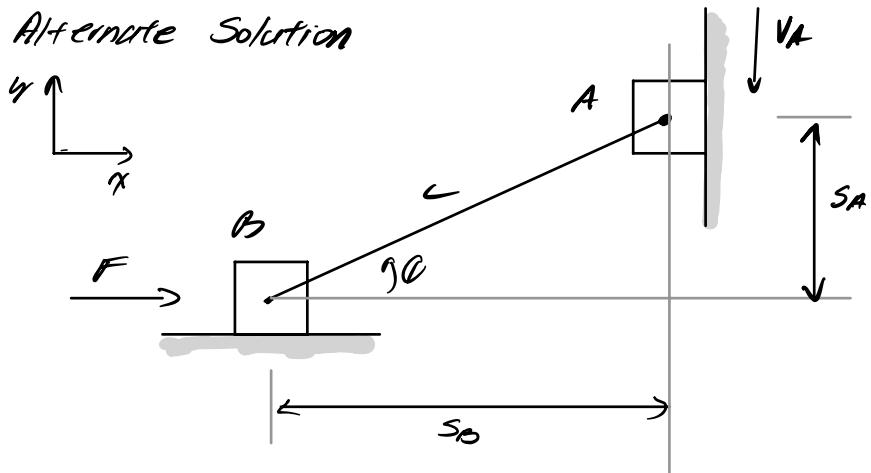


Alternate Solution



$$\sin \theta = \frac{SA}{L}$$

$$\cos \theta = \frac{SB}{L}$$



$$\textcircled{A} \quad \begin{aligned} \sum F_x : & F_B \cos \theta - N_A = 0 \\ \sum F_y : & -m_A g + F_B \sin \theta = m_A a \end{aligned} \quad \begin{matrix} \text{unknowns} \\ N_A, N_B, F_B \\ a_A, a_B \end{matrix}$$

$$\textcircled{B} \quad \begin{aligned} \sum F_x : & -F_B \cos \theta + F = m_B a \\ \sum F_y : & N_B - m_B g - F_B \sin \theta = 0 \end{aligned} \quad \begin{matrix} \text{unknowns} \\ a_B, a_B, a_B \end{matrix}$$

$$\vec{a}_B = \vec{a}_0 + \vec{\omega} \times \vec{r}_{A/B} - \omega^2 \vec{r}_{A/B}$$

$$a_{Bx} = a_0 i + \omega^2 L (\cos \theta i + \sin \theta j) - \omega^2 L (\cos \theta i + \sin \theta j)$$

$$a_{By} = a_0 j + \omega L \cos \theta i - \omega L \sin \theta j - \omega^2 L \cos \theta i - \omega^2 L \sin \theta j$$

$$\textcircled{1} \quad 0 = a_B - \omega L \sin \theta - \omega^2 L \cos \theta \quad \begin{matrix} \text{unknowns} \\ a_B, a_B, \omega, \omega \end{matrix}$$

$$\textcircled{2} \quad a_B = \omega L \cos \theta - \omega^2 \sin \theta \quad \begin{matrix} \text{unknowns} \\ a_B, a_B, \omega, \omega \end{matrix}$$

$$\vec{v}_A = \vec{v}_B + \vec{\omega} \times \vec{r}_{AB}$$

$$-v_{Aj} = v_{Bj} + \omega \hat{k} \times (L \cos \theta_j + L \sin \theta_j)$$

$$-v_{Aj} = v_{Bj} + \omega L \cos \theta_j - \omega L \sin \theta_j$$

$$\begin{aligned} 1: \quad 0 &= v_B - \omega L \sin \theta \\ 2: \quad -v_A &= \omega L \cos \theta \end{aligned} \quad \left. \begin{array}{l} \text{unknowns } v_B, \omega \\ \text{unknowns } v_A, \omega \end{array} \right\}$$

In summary

$$1) \quad F_{BA} \cos \theta - N_A = 0$$

$$2) \quad -m_A g + F_{BA} \sin \theta = m_A a$$

$$3) \quad -F_{BA} \cos \theta + F = m_B a$$

$$4) \quad N_B - m_B g - F_{BA} \sin \theta = 0$$

$$5) \quad 0 = a_B + \alpha L \sin \theta + \omega^2 L \cos \theta$$

$$6) \quad a_A = -\alpha L \cos \theta + \omega^2 L \sin \theta$$

$$7) \quad 0 = v_B - \omega L \sin \theta$$

$$8) \quad -v_A = +\omega L \cos \theta$$

Unknowns  $F_{BA}, N_A, N_B, a_A, a_B, v_A, \alpha, \omega$

8 unknowns