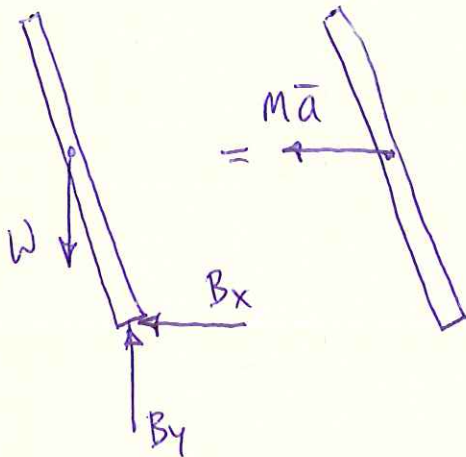


PROB. 16.2

$L = 0.3 \text{ m}$ ,  $m = 2.5 \text{ kg}$ , FIND  $a_{\text{max}}$ : ASSUME  $R_c = 0$



$$\vec{W} = (-mg)\hat{j} = [-(2.5 \text{ kg})(9.81 \frac{\text{m}}{\text{s}^2})]\hat{j}$$

$$\vec{W} = (-24.25)\hat{j} \text{ N}$$

$$\sum \vec{F}_x = m\vec{a}_x : -B_x = (2.5 \text{ kg})(-a_x)$$

$$B_x = 2.5 a_x$$

$$\sum \vec{F}_y = m\vec{a}_y : B_y - mg = 0 \Rightarrow B_y = 24.52 \text{ N}$$

$$\sum \vec{M}_B = \sum (\vec{M}_B)_{\text{EFF}} : \vec{r}_w \times \vec{W} = \vec{r}_w \times m\vec{a}$$

$$\vec{r}_w \times \vec{W} = (1.258)\hat{k} \text{ N}\cdot\text{m}$$

$$\vec{r}_w \times m\vec{a} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ -0.0513 & 0.1409 & 0 \\ -2.5a & 0 & 0 \end{vmatrix}$$

$$= [0 - (0.1409)(-2.5a)]\hat{k} = (0.3522a)\hat{k} \text{ N}\cdot\text{m}$$

$$\sum \vec{M}_B = \sum (\vec{M}_B)_{\text{EFF}} : 1.258 = 0.3522 a$$

$$a_{\text{max}} = 3.571 \frac{\text{m}}{\text{s}^2} \leftarrow$$