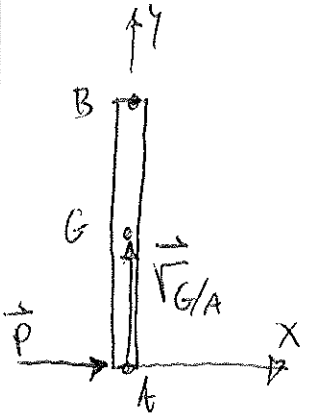
PROB. 15-105



$\omega = 0$, $\vec{a}_A = (3.6)\hat{i}\ \frac{m}{s^2}$, $\alpha\hat{k} = (6)\hat{k}\ \frac{RAD}{s}$

a) FIND $\vec{a}_G$

$$\vec{a}_G = \vec{a}_A + \alpha\hat{k} \times \vec{r}_{G/A} - \omega^2 \vec{r}_{G/A}$$

$$\vec{r}_{G/A} = (0.45)\hat{j}\ m$$

$$\alpha\hat{k} \times \vec{r}_{G/A} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 0 & 0 & 6 \\ 0 & 0.45 & 0 \end{vmatrix}$$

$$= [0 - (6)(0.45)]\hat{i} = (-2.7)\hat{i}\ \frac{m}{s^2}$$

$$\vec{a}_G = (3.6)\hat{i} + (-2.7)\hat{i} = (0.9)\hat{i}\ \frac{m}{s^2}$$

b) FIND $\vec{a}_B$

$$\vec{a}_B = \vec{a}_A + \alpha\hat{k} \times \vec{r}_{B/A} - \omega^2 \vec{r}_{B/A}, \quad \vec{r}_{B/A} = (0.9)\hat{j}\ m$$

$$\alpha\hat{k} \times \vec{r}_{B/A} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 0 & 0 & 6 \\ 0 & 0.9 & 0 \end{vmatrix}$$

$$= [0 - (6)(0.9)]\hat{i} = (-5.4)\hat{i}\ \frac{m}{s^2}$$

$$\vec{a}_B = (3.6)\hat{i} + (-5.4)\hat{i} = (-1.8)\hat{i}\ \frac{m}{s^2}$$