

Two rods, AB and BC, are connected and moving. A pin at point A follows the vertical slot shown. Find the ICZV for each rod at the instant shown. If rod BC has an angular velocity of 3 rad/s, find the angular velocity of rod AB.

$$\vec{\omega}_{AB} ?$$

$$\text{Assume } \vec{\omega}_{AB} = \omega_{AB} \hat{k}$$

$$\vec{v}_B = \vec{\omega}_{BC} \times \vec{r}_{B/C}$$

$$\vec{\omega}_{BC} = 3 \text{ rad/s } \hat{k}$$

$$\vec{r}_{B/C} = 0.1 \text{ m } \hat{j}$$

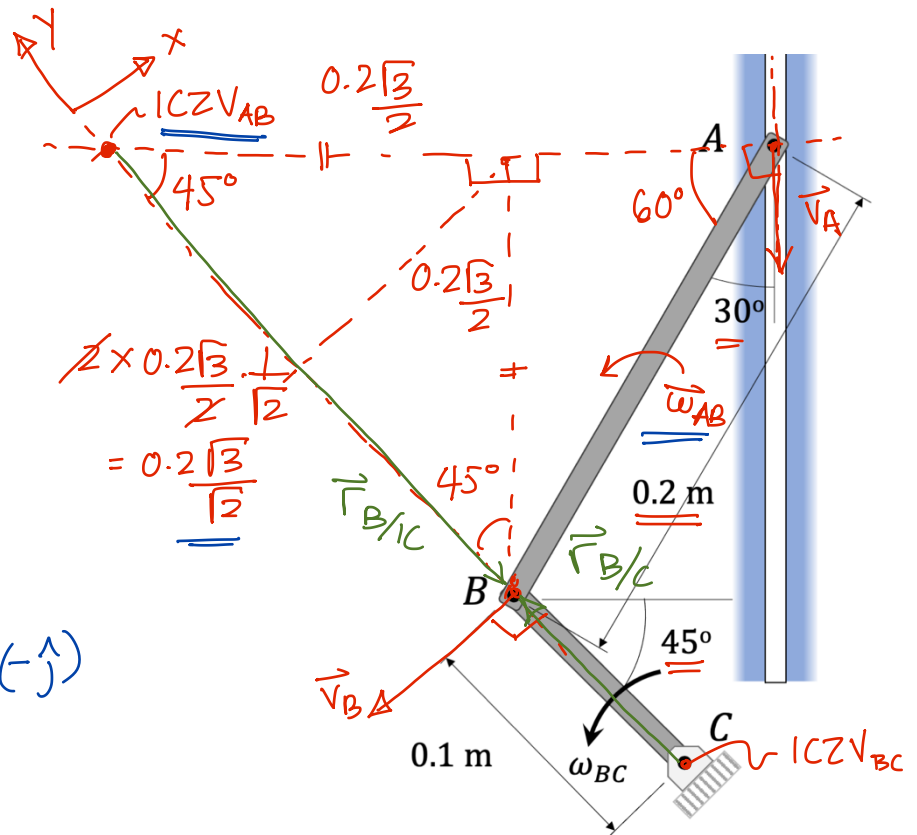
$$\vec{v}_B = 3 \hat{k} \times 0.1 \hat{j} = -0.3 \text{ m/s } \hat{i}$$

$$\begin{aligned} \vec{v}_B &= \vec{\omega}_{AB} \times \vec{r}_{B/A} \\ &= \omega_{AB} \hat{k} \times 0.2 \frac{\sqrt{3}}{2} (-\hat{j}) \\ &= 0.2 \frac{\sqrt{3}}{2} \omega_{AB} \hat{i} \end{aligned}$$

$$\vec{v}_B = \vec{v}_B$$

$$-0.3 \hat{i} = 0.2 \frac{\sqrt{3}}{2} \omega_{AB} \hat{i}$$

$$\Rightarrow \omega_{AB} = -\frac{0.3}{0.2} \frac{\sqrt{3}}{2} = -1.22 \text{ rad/s}$$



$$\vec{\omega}_{AB} = -1.22 \text{ rad/s } \hat{k}$$