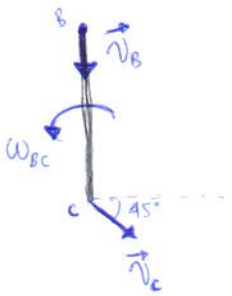
• Ecuación de velocidad relativa: $\vec{v}_B = \vec{v}_C + \vec{\omega}_{BC} \times \vec{r}_{B/C}$

(3) • Analizando BC:

• Vectores de velocidad y posición:



$$\vec{v}_B = (-v_B\,\hat{j})\ m/s \quad ; \quad \vec{v}_C = (8\cos 45°\,\hat{i} - 8\,\text{sen}\,45°\,\hat{j}) = (5.657\,\hat{i} - 5.657\,\hat{j})\ m/s$$

$$\vec{\omega}_{BC} = (\omega_{BC}\,\hat{k})\ rad/s \quad ; \quad \vec{r}_{B/C} = (2\,\hat{j})\ m$$

• Sustituyendo en la ecuación de velocidad:

$$(-v_B\,\hat{j}) = (5.657\,\hat{i} - 5.657\,\hat{j}) + (\omega_{BC}\,\hat{k}) \times (2\,\hat{j})$$

$$(-v_B\,\hat{j}) = (5.657\,\hat{i} - 5.657\,\hat{j}) + (-2\omega_{BC}\,\hat{i})$$

• Ecuaciones escalares:

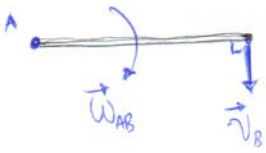
Comp. $\hat{i}$ → $0 = 5.657 - 2\omega_{BC}$ ... (i)

Comp. $\hat{j}$ → $-v_B = -5.657$ ... (ii)

De (i) → $\omega_{BC} = 2.83\ rad/s$

De (ii) → $v_B = 5.657\ m/s$

• Analizando AB:



$$\vec{v}_B = \vec{\omega}_{AB} \times \vec{r}_{B/A} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 0 & 0 & -\omega_{AB} \\ 2 & 0 & 0 \end{vmatrix} = (-2\omega_{AB}\,\hat{j})$$

$$(-5.657\,\hat{j}) = (-2\omega_{AB}\,\hat{j})$$

• Ec. escalar → $-5.657 = -2\omega_{AB}$ → $\omega_{AB} = 2.83\ rad/s$

Resultados

$\therefore$

$\omega_{BC} = 2.83\ rad/s$ ↻

$\omega_{AB} = 2.83\ rad/s$ ↻