PROB. 15-69

$\omega_{AB} = 20 \frac{RAD}{SEC}$ CCW

b) FIND v_H

$\vec{v}_H = \vec{v}_B + \vec{v}_{H/B} = \vec{v}_B + (\omega)\hat{k} \times \vec{r}_{H/B}$

FROM PROB. 15-68,

$\vec{v}_B = (80)\hat{i} + (60)\hat{j} \frac{IN}{SEC}$, $\omega = -12.0 \frac{RAD}{SEC}$

$$(\omega)\hat{k} \times \vec{r}_{H/B} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 0 & 0 & \omega \\ 10 & -10 & 0 \end{vmatrix}$$

$= [0 - (\omega)(-10)]\hat{i} - [0 - (\omega)(10)]\hat{j} = (10\omega)\hat{i} + (10\omega)\hat{j}$

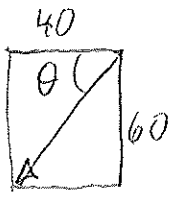
$(v_{Hx})\hat{i} + (v_{Hy})\hat{j} = (80)\hat{i} + (60)\hat{j} + (10\omega)\hat{i} + (10\omega)\hat{j}$

X-DIRECTION:

$v_{Hx} = 80 + 10(-12) = -40 \frac{IN}{SEC}$

$v_{Hy} = 60 + 10(-12) = -60 \frac{IN}{SEC}$

$v = \sqrt{40^2 + 60^2} = 72.11 \frac{IN}{SEC}$



$\theta = TAN^{-1}\left(\frac{60}{40}\right) = 56.31°$

$v = 72.11 \frac{IN}{SEC}$ $56.31°$