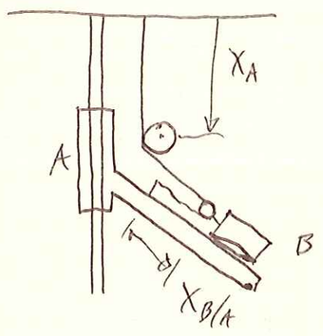
PROB. 11-124

$\vec{v}_A = (-9)\hat{j}$ $\frac{IN}{S}$, $\vec{a}_A = (-15)\hat{j}$ $\frac{IN}{S^2}$

FIND $\vec{v}_B$ AND $\vec{a}_B$



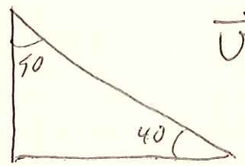
$x_A + 2x_{B/A} = \text{CONSTANT}$

$v_A + 2v_{B/A} = 0$

$v_{B/A} = -4.5$ $\frac{IN}{S}$ UP THE RAMP

$a_A + 2a_{B/A} = 0$

$a_{B/A} = -7.5$ $\frac{IN}{S^2}$



$\vec{v}_{B/A} = (-4.5\cos 40)\hat{i} + (4.5\sin 40)\hat{j}$

$= (-3.447)\hat{i} + (2.892)\hat{j}$ $\frac{IN}{S}$

$\vec{a}_{B/A} = (-7.5\cos 40)\hat{i} + (7.5\sin 40)\hat{j}$

$= (-5.745)\hat{i} + (4.821)\hat{j}$ $\frac{IN}{S^2}$

$\vec{v}_B = \vec{v}_A + \vec{v}_{B/A} = (-3.447)\hat{i} + (-6.108)\hat{j}$ $\frac{IN}{S}$

$|\vec{v}_B| = 7.013$ $\frac{IN}{S}$, $\theta = 60.6°$ $\swarrow$ $= 240°$

$\vec{a}_B = \vec{a}_A + \vec{a}_{B/A} = (-5.745)\hat{i} + (-10.18)\hat{j}$ $\frac{IN}{S^2}$

$|\vec{a}_B| = 11.69$ $\frac{IN}{S^2}$, $\theta = 60.6°$ $\swarrow$