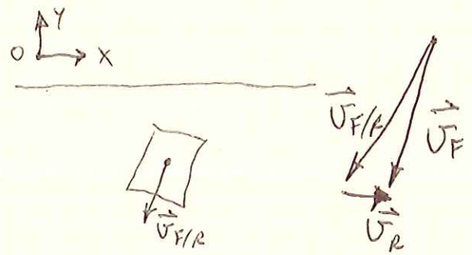
PROB. 11-119

$|\vec{v}|_F = 9.8\ ^{kN}$, $\theta_F = 180 + 70 = 250°$

$|\vec{v}|_{F/R} = 10\ ^{kN}$, $\theta_{F/R} = 270 - 30 = 240°$

FIND $\vec{v}_{RIVER}$



$\vec{v}_F = \vec{v}_R + \vec{v}_{F/R}$

$\vec{v}_R = \vec{v}_F - \vec{v}_{F/R}$

$\vec{v}_F = (9.8\cos 250)\hat{i} + (9.8\sin 250)\hat{j} = (-3.352)\hat{i} + (-9.209)\hat{j}\ ^{kN}$

$\vec{v}_{F/R} = (10\cos 240)\hat{i} + (10\sin 240)\hat{j} = (-5)\hat{i} + (-8.66)\hat{j}\ ^{kN}$

$\vec{v}_R = (-3.352)\hat{i} + (-9.209)\hat{j} - [(-5)\hat{i} + (-8.66)\hat{j}]\ ^{kN}$

$\vec{v}_R = (1.648)\hat{i} + (-0.549)\hat{j}\ ^{kN}$

$\boxed{|\vec{v}_R| = 1.737\ ^{kN},\ \theta = -18.42°}$