

To FINISH PROBLEM... Apply Equilib conditions (c9)

Start by taking Moments about A.

$$\vec{M} = \sum \vec{r} \times \vec{F} \quad \text{need } \vec{r} \text{ for each } \vec{F}$$

for \vec{W} , $\vec{r} = 0.306\hat{i} - 0.257\hat{j} - 0.6\hat{k}$
 $\vec{W} = -490.5\hat{j}$

for \vec{B} $\vec{r} = -1.2\hat{k}$
 $\vec{B} = B_x\hat{i} + B_y\hat{j}$

for \vec{F}_{CD} $\vec{r} = 0.613\hat{i} - 0.514\hat{j} + 0\hat{k}$
 $\vec{F}_{CD} = \|F_{CD}\| (0.828\hat{i} + 0.386\hat{j} + 0.405\hat{k})$

\vec{A} has no moment about point A.

$$\vec{M}_W = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 0.306 & -0.257 & -0.6 \\ 0 & -490.5 & 0 \end{vmatrix} = -\hat{i}(0.6)(490.5) + \hat{k}(0.306)(490.5)$$

$$\vec{M}_B = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 0 & 0 & -1.2 \\ B_x & B_y & 0 \end{vmatrix} = \hat{i}(1.2)B_y - \hat{j}(B_x)(1.2)$$

$$\vec{M}_{F_{CD}} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 0.613 & -0.514 & 0 \\ \|F_{CD}\| (0.828 & 0.386 & 0.405) \end{vmatrix} = \|F_{CD}\| \left(\hat{i}(-0.514)(0.405) - \hat{j}(0.613)(0.405) \right) + \hat{k}[(0.613)(0.386) + (0.514)(0.828)]$$