Homework H6.A

***Given***: A force $\vec{F}$ acts at end C of the bent bar shown below.

Find:

a) Determine the moment arm d of $\vec{F}$ about point A.

b) Using the moment arm d found above, determine the moment about point A, $\vec{M}_A$, due to the force $\vec{F}$. Write your answer as a vector in terms of, at most: b, L, θ and F.

c) Using the cross product $\vec{r}_{AC} \times \vec{F}$, determine the moment about point A, $\vec{M}_A$, due to the force $\vec{F}$. Write your answer as a vector in terms of, at most: b, L, θ and F. Compare this answer with what you found in part b) above.
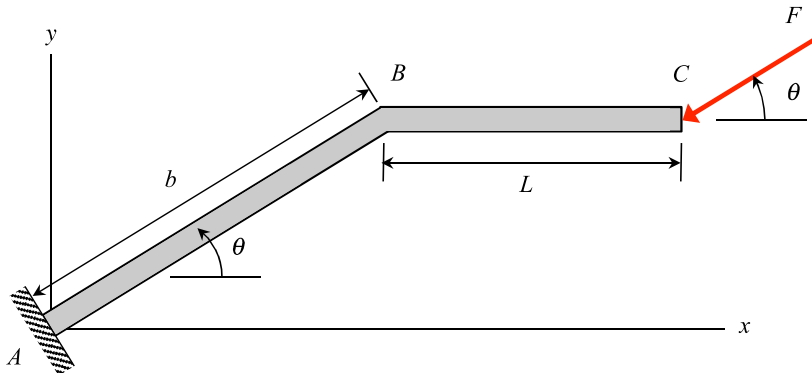
Given: A pre-tensioned cable DE is attached between ground E and end D of the pipe structure shown. The tension in cable DE is T_{DE}. Let $\vec{F}_{DE}$ represent the force vector on the structure at D due to the cable.

Find:

a) Write out $\vec{F}_{DE}$ in terms of its Cartesian components.

b) Determine the moment about point A due to $\vec{F}_{DE}$ using $\vec{r}_{AD} \times \vec{F}_{DE}$.

c) Determine the moment about point A due to $\vec{F}_{DE}$ using $\vec{r}_{AE} \times \vec{F}_{DE}$. Compare your answer with what you found in part b) above.

d) Determine the moment about point C due to $\vec{F}_{DE}$.

Write your answers as vectors and in terms of, at most: T_{DE} and d.