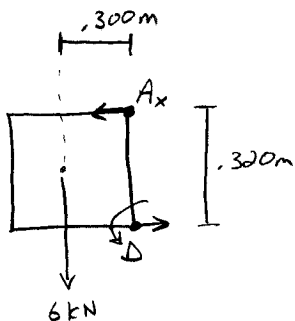


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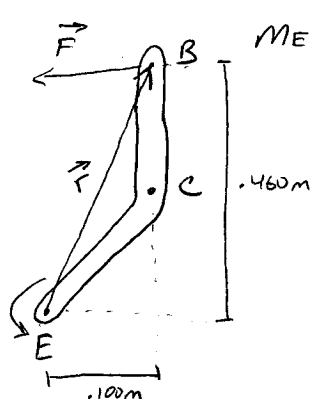
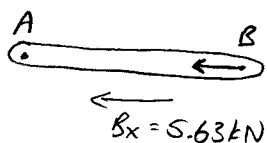
Pg. 1

a)



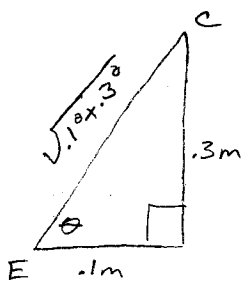
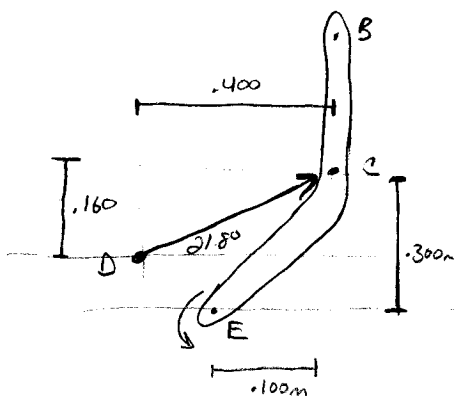
$$\begin{aligned} \uparrow M_D &= Fd \\ &= (6 \text{ kN})(.300 \text{ m}) \\ &= 1.8 \text{ kN}\cdot\text{m} \end{aligned}$$

$$\begin{aligned} M_D &= A_x d \\ A_x &= \frac{M_D}{d} = \frac{1.8 \text{ kN}\cdot\text{m}}{.300 \text{ m}} \\ A_x &= 5.63 \text{ kN} \leftarrow \end{aligned}$$

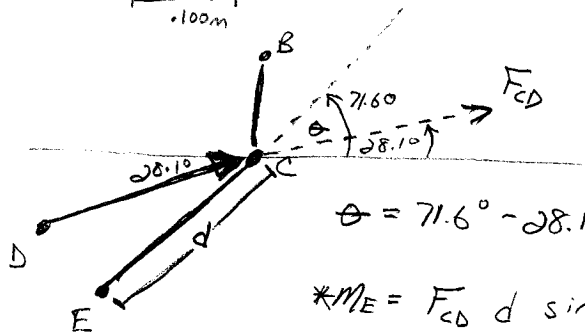
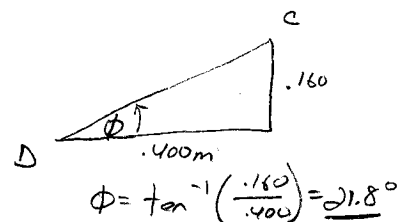


$$\begin{aligned} M_E &= \vec{r} \times \vec{F} \\ &= (.1\hat{i} - .46\hat{j}) \times (5.63 \times 10^3 \hat{i}) \\ &= \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ .1 & -.46 & 0 \\ 5.63 \times 10^3 & 0 & 0 \end{vmatrix} = +2589.8 \end{aligned}$$

$$M_E = 2.59 \text{ kN}\cdot\text{m} \quad *$$



$$\theta = \tan^{-1}\left(\frac{.300 \text{ m}}{.100 \text{ m}}\right) = 71.6^\circ$$



$$\theta = 71.6^\circ - 21.8^\circ = 49.8^\circ$$

$$*M_E = F_{CD} d \sin \theta$$

$$\frac{*M_E}{d \sin \theta} = F_{CD}$$

$$\frac{2.59 \text{ kN}\cdot\text{m}}{\sqrt{.1^2 + .3^2} \sin(49.8)} = F_{CD}$$

$$10723.1 \text{ N} = F_{CD}$$

$$10.72 \text{ kN} = F_{CD}$$

Member CD exerts 10.72 kN @ 21.8°

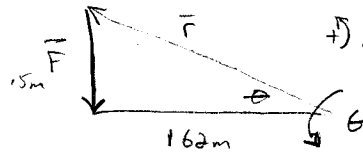
6.149

b)

$$460 - 320 = 140$$

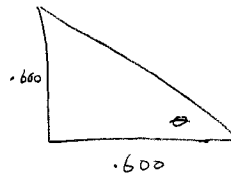
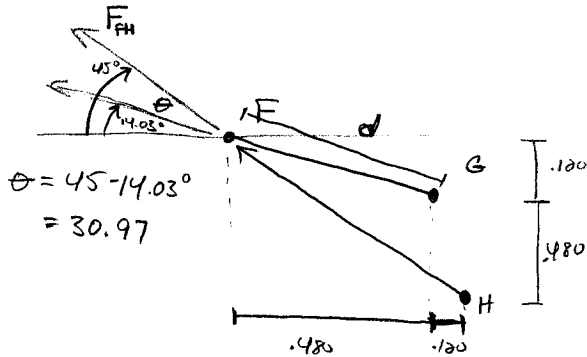
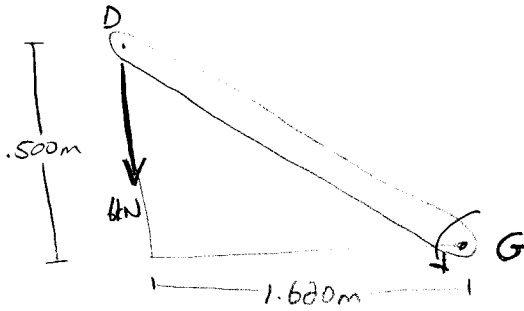
$$\vec{r} = -1.62\hat{i} + .5\hat{j}$$

$$\vec{F} = -6\text{kN}\hat{i}$$

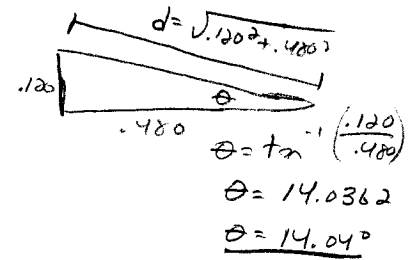


$$+ \uparrow M_G = \vec{r} \times \vec{F} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ -1.62\text{m} & .5\text{m} & 0 \\ -6\text{kN} & 0 & 0 \end{vmatrix} = +3\text{kN}\cdot\text{m} \hat{k}$$

$$M_G = 3\text{kN}\cdot\text{m}$$



$$\theta = 45^\circ$$



$$M_G = F_{FH} d \sin(\theta)$$

$$\frac{M_G}{d \sin \theta} = F_{FH}$$

$$\frac{3\text{kN}\cdot\text{m}}{\sqrt{.120^2 + .480^2} \sin(30.97^\circ)} = F_{FH}$$

$$11.78\text{kN} = F_{FH}$$