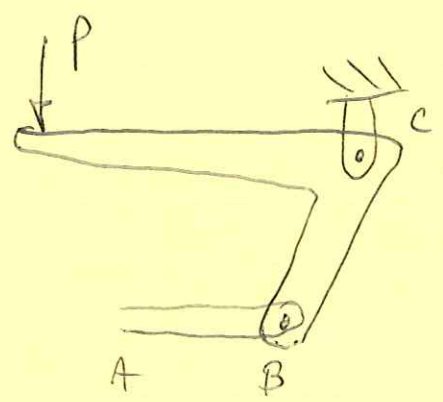


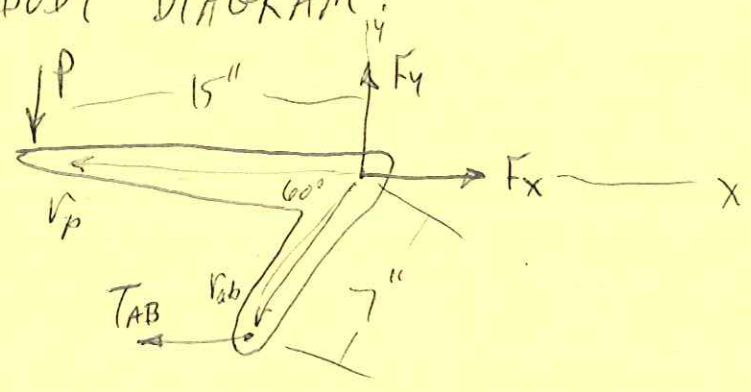
EXAMPLE PROB. 4.17



$T_{AB} = 200 \text{ LB}$

FIND P , REACTION AT C

FREE-BODY DIAGRAM:



FIND FORCES:

$$\vec{P} = -P \hat{j} \text{ LB}, \quad \vec{T}_{AB} = -200 \hat{c} \text{ LB}$$

FIND POSITION VECTORS:

$$\vec{r}_P = -15 \hat{c} \text{ IN}$$

$$\vec{r}_{ab} = (7 \cos 240^\circ) \hat{c} + (7 \sin 240^\circ) \hat{j} \text{ IN}$$

$$\vec{r}_{ab} = (-3.5) \hat{c} + (-6.06) \hat{j} \text{ IN}$$

$$\Sigma F_x = 0 :$$

$$-T_{AB} + F_x = 0 \quad ; \quad F_x = 200 \text{ LB} \quad \text{OR} \quad \vec{F}_x = (200) \hat{i} \text{ LB}$$

$$\Sigma F_y = 0 :$$

$$F_y - P = 0$$

$$F_y = P$$

$$\Sigma M_o = 0$$

$$\vec{r}_p \times \vec{P} + \vec{r}_{ab} \times \vec{T}_{AB} = 0$$

$$\cancel{(-15\hat{i})} \times \cancel{(-P\hat{j})} + 0$$

$$\vec{M}_1 = \vec{r}_p \times \vec{P} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ -15 & 0 & 0 \\ 0 & -P & 0 \end{vmatrix}$$

$$\vec{M}_1 = [0] \hat{i} - [0] \hat{j} + [(-15)(-P)] \hat{k} \quad \text{IN-LB}$$

$$\vec{M}_1 = (15P) \hat{k} \quad \text{IN-LB}$$

$$\vec{M}_2 = \vec{r}_{ab} \times \vec{T}_{AB} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ -3.5 & -6.06 & 0 \\ -200 & 0 & 0 \end{vmatrix}$$

$$\vec{M}_2 = [0] \hat{i} + [0] \hat{j} + [(-3.5)(0) - (-6.06)(-200)] \hat{k} \quad \text{IN-LB}$$

$$\vec{M}_2 = (-1210) \hat{k} \quad \text{IN-LB}$$

$$(15P) \hat{k} + (-1210) \hat{k} = 0$$

$$P = 80.8 \text{ LB} \quad \text{OR} \quad \vec{P} = (-80.8) \hat{j} \text{ LB}$$

$$F_y = 80.8 \text{ LB} \quad \text{OR} \quad \vec{F}_y = (80.8) \hat{j} \text{ LB}$$