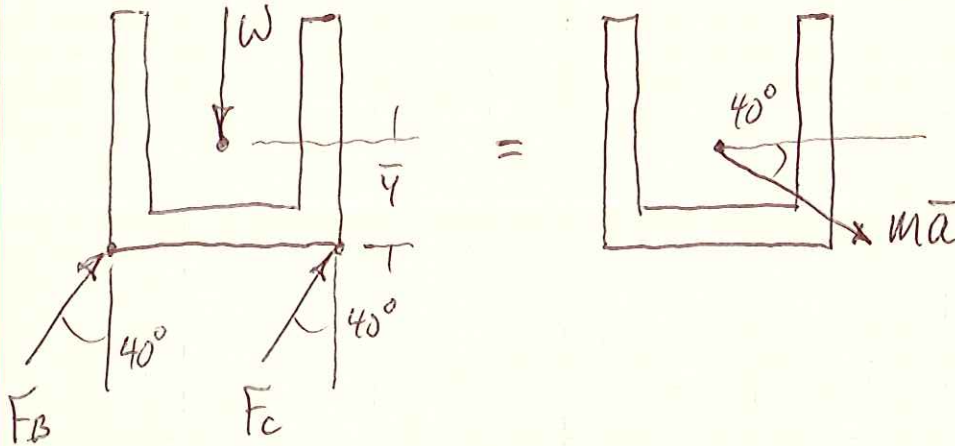


PROB. 16-17

$W_{\text{BAR}} = 8 \text{ LB}$  EACH, FIND FORCES IN EACH LINK  
CURVILINEAR TRANSLATION



$$\bar{y} = \frac{\sum y_i W_i}{\sum W_i} = \frac{2\left(\frac{15}{2}\right)(8 \text{ LB})}{3(8 \text{ LB})} = 5 \text{ IN}$$

$$\vec{W} = (-W)\hat{j} = (-24)\hat{j} \text{ LB}$$

$$\vec{F}_B = F_B [(\sin 40^\circ)\hat{i} + (\cos 40^\circ)\hat{j}] = F_B [(0.6428)\hat{i} + (0.766)\hat{j}] \text{ LB}$$

$$\vec{F}_C = F_C [(0.6428)\hat{i} + (0.766)\hat{j}] \text{ LB}$$

$$m\vec{a} = \left(\frac{W}{g}\right)a [(\cos 40^\circ)\hat{i} + (-\sin 40^\circ)\hat{j}]$$

$$= \frac{(24 \text{ LB})}{(32.2 \frac{\text{ft}}{\text{s}^2})} \cdot a [(\cos 40^\circ)\hat{i} + (-\sin 40^\circ)\hat{j}]$$

$$m\vec{a} = a [(0.571)\hat{i} + (-0.4791)\hat{j}] \text{ LB}$$

$$\sum F_x = ma_x: 0.6428 F_B + 0.6428 F_C = 0.571 a$$

$$\boxed{F_B = 0.8883 a - F_C}$$

PROB. 16-17 CONT.

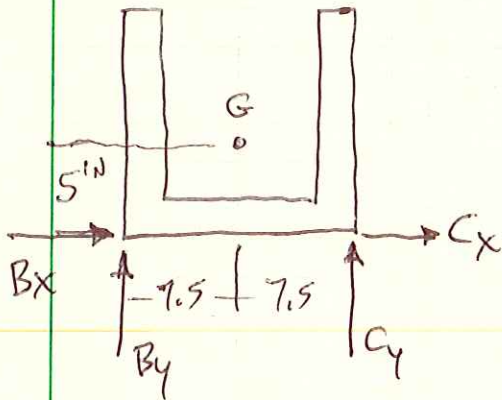
$$\sum F_y = ma_y : 0.766 F_B + 0.766 F_C - 24 = -0.4791 a$$

$$F_B = 31.33 - F_C - 0.6254 a$$

$$0.8883 a - F_C = 31.33 - F_C - 0.6254 a$$

$$a = 20.70 \frac{\text{ft}}{\text{s}^2} \searrow 40^\circ$$

$$\sum \vec{M}_G = \sum (\vec{M}_G)_{\text{EFF}} : \uparrow$$



$$5 B_x - 7.5 B_y + 5 C_x + 7.5 C_y = 0$$

$$5(0.6428 F_B) - 7.5(0.766 F_B) + 5(0.6428 F_C) + 7.5(0.766 F_C) = 0$$

$$-2.531 F_B + 8.959 F_C = 0$$

$$F_C = 0.2825 F_B$$

$$F_B = 0.8883(20.7) - 0.2825 F_B \Rightarrow F_B = 14.34 \text{ LB COMPRESSION}$$

$$F_C = 0.2825(14.34) = 4.050 \text{ LB COMPRESSION}$$