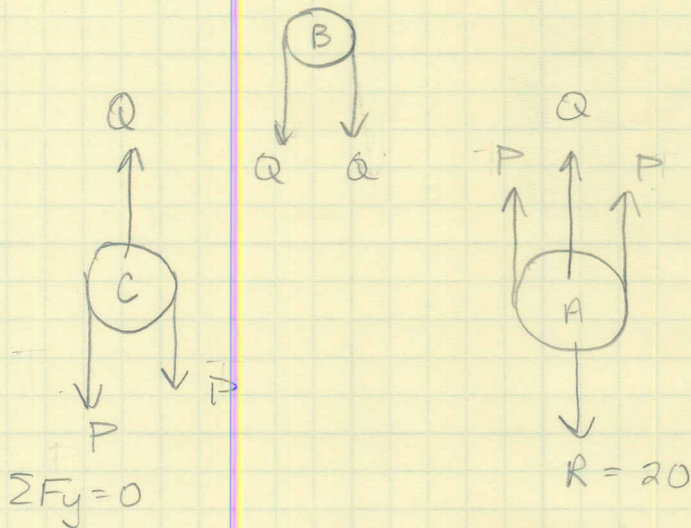


6-70,

What is P?



$$\sum F_y = 0$$

$$Q - 2P = 0$$

$$Q = 2P$$

$$Q = 2(5) = 10$$

$$\sum F_y = 0$$

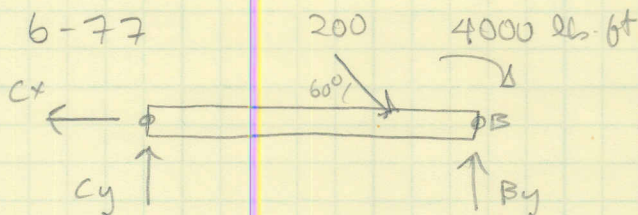
$$2P + Q - 20 = 0$$

$$2P + [2P] - 20 = 0$$

$$4P = 20$$

$$P = 5 \text{ lb}$$

6-77



Section CB

$$\sum M_C = 0 \quad -200 \cos 60^\circ (8) - 4000 + B_y (12) = 0$$

$$\sum F_x = 0 = -C_x + 200 \cos 60^\circ = 0$$

$$C_x = 100 \text{ lb} \leftarrow$$

$$B_y = 448.8 \text{ lb} \uparrow$$

$$\sum F_y = 448.8 + C_y - 200 \sin 60^\circ = 0$$

$$C_y = -275.6 \text{ lb} \downarrow$$



Section AB

$$\sum F_x = A_x + 100 - 500 \frac{5}{13} = 0$$

$$A_x = 92.3 \text{ lb} \rightarrow$$

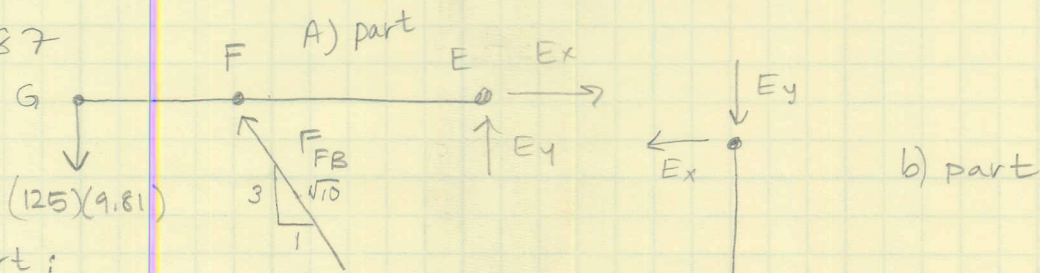
$$\sum F_y = 0 = A_y - 500 \frac{12}{13} + 275.6 = 0$$

$$A_y = 186 \text{ lb}$$

$$\sum M_A = 0 = +M_a - 500 \frac{12}{13} (4) + 275.6 (8) = 0$$

$$M_a = -359 \text{ lb}\cdot\text{ft}$$

6-87



A) part:

$$\sum M_E = 0 = F_{FB} \frac{3}{\sqrt{10}} (2) + 1226.25 (3) = 0$$

$$F_{FB} = - \frac{3678.75}{\frac{3}{\sqrt{10}} (2)} = 1938.9 \text{ N}$$

$$\sum F_y = 0 = 1938.9 \left(\frac{3}{\sqrt{10}} \right) - 1226.25 + E_y = 0$$

$$E_y = -613.125 \text{ N} \downarrow$$

$$\sum F_x = 0 = -1938.9 \left(\frac{1}{\sqrt{10}} \right) + E_x = 0$$

$$E_x = 613.125 \text{ N} \rightarrow$$

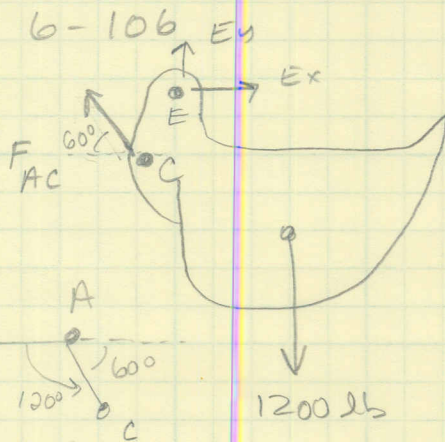
b) part:

$$\sum M_C = 0 = -F_{BD} \sin 45^\circ (1) + E_x (3) = 0$$

$$F_{BD} = - \frac{613.125 (3)}{\sin 45^\circ} = 2601.27 \text{ N}$$

$$F_{BD} = 1939 \text{ N}$$

$$F_{BD} = 2601 \text{ N}$$



* links AB, AD, & AC
can be modeled as
two-force members

Find A_B , A_C , & A_D

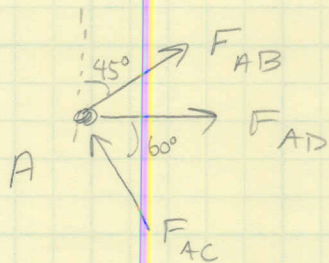
$$\sum M_E = 0;$$

$$F_{AC} \cos 60^\circ (1) + F_{AC} \sin 60^\circ (0.25) - 1200 (1.5) = 0$$

$$0.5 F_{AC} + 0.2165 F_{AC} = 1800$$

$$F_{AC} = \frac{1800}{0.7165} = 2512.2 \text{ lb}$$

using method of joints:



$$\sum F_y = 0 = F_{AB} \cos 45^\circ + F_{AC} \sin 60^\circ = 0$$

$$F_{AB} = -\frac{F_{AC} \sin 60^\circ}{\cos 45^\circ}$$

$$F_{AB} = -\frac{2512.2 \sin 60^\circ}{\cos 45^\circ} = 3076.79 \text{ lb}$$

$$\sum F_x = 0 = F_{AD} - 3076.8 \sin 45^\circ - 2512 \cos 60^\circ = 0$$

$$F_{AD} = 3431.72 \text{ lb}$$

$$F_{AB} = 3076.8 \text{ lb} \leftarrow$$