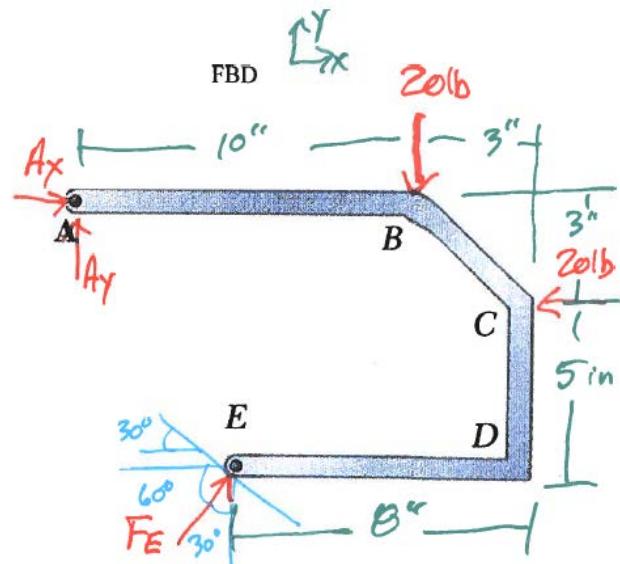
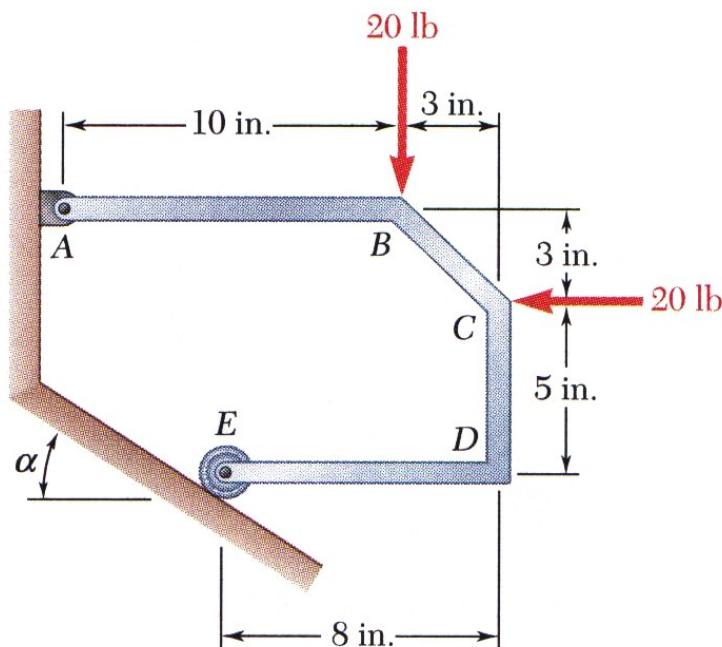


**Problem 2**

- a. For the frame shown below, draw the complete free body diagram.



- b. If  $\alpha = 30^\circ$ , determine all unknown reactions at support A and E.

$$\sum M_A = 0 \\ 20\text{ lb}(10") + 20\text{ lb}(3") - F_E \cos 30^\circ(5") - F_E \sin 30^\circ(\theta") = 0 \\ F_E = 31.2 \text{ lbs} \angle 60^\circ$$

$$\sum F_y = 0 \\ A_y - 20\text{ lb} + F_E \cos 30^\circ = 0 \\ A_y = -7.03 \text{ lbs} = 7.03 \text{ lbs} \downarrow$$

$$\sum F_x = 0 \\ A_x - 20 + F_E \sin 30^\circ = 0 \\ A_x = 4.4 = 4.4 \text{ lbs} \rightarrow$$

**ANSWER:**

$$A_x = 4.4 \text{ lbs} \rightarrow A_y = 7.03 \text{ lbs} \downarrow F_E = 31.2 \text{ lbs} \angle 60^\circ$$