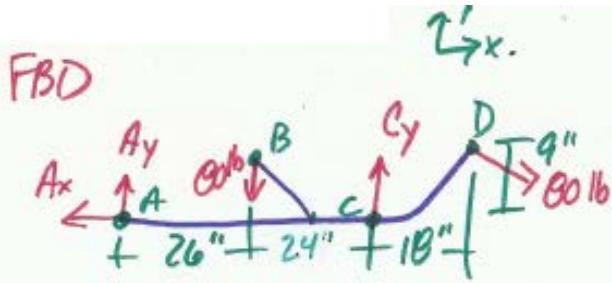
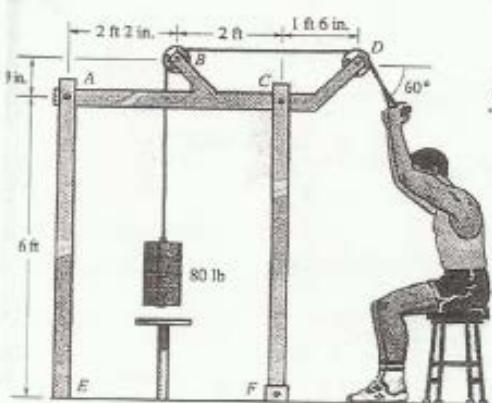


Problem 3 – Frame I

The man using the exercise machine is holding the 80 lb weight stationary in the position shown. What are the reactions at the built-in support E and the pin support F ? (A and C are pinned connections).

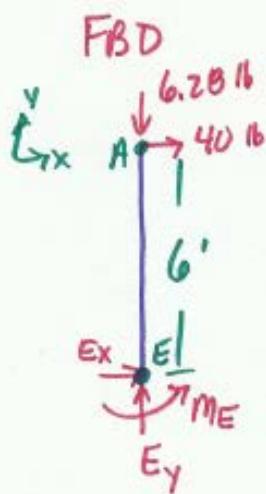


$$\begin{aligned} \uparrow \sum F_y = 0 &= A_y - 80 + C_y - 80 \sin 60^\circ \\ \rightarrow \sum F_x = 0 &= 80 \cos 60^\circ - A_x \end{aligned}$$

$C_y = 143 \text{ lb } \uparrow \text{ on } ABCD$

$A_y = 6.28 \text{ lbs } \uparrow \text{ on } ABCD$

$A_x = 40 \text{ lb } \leftarrow \text{ on } ABCD$



$$\begin{aligned} \rightarrow \sum F_x = 0 &= 40 + E_x & E_x = -40 = 40 \text{ lbs } \leftarrow \\ \uparrow \sum F_y = 0 &= -6.28 + E_y & E_y = 6.28 \text{ lbs } \uparrow \\ \downarrow \sum M_E = 0 &= 40 \text{ lb}(6') - M_E & M_E = 240 \text{ Ft-lbs } \uparrow \end{aligned}$$

