

Problem 7: Determine the forces acting on member $ABCD$ of the frame.

2 FORCE MEMBER

$\rightarrow \sum F_x = 0 = 75 + A_x \quad A_x = 75 \text{ lbs} \rightarrow$

$\hookrightarrow \sum M_F = 0 = 75(6) + 12A_y + 10A_x$

$A_y = -150 = 150 \downarrow$

$\hookrightarrow \sum M_B = 0 = 12(75) + 12(75) - 6C_x$

$C_x = 300 \rightarrow \text{on } ABCD$

$\rightarrow \sum F_x = 0 = 75 + C_x - 75 + \frac{1}{\sqrt{2}} BE$

$BE = -424 \text{ lbs}$

$= 424 \text{ K on } ABCD$

$\uparrow \sum F_y = 0 = A_y - \frac{1}{\sqrt{2}} BE + C_y$

$= -150 - \frac{1}{\sqrt{2}}(-424) + C_y$

$C_y = -150 = 150 \downarrow$

ANSWER: $A_x = 75 \text{ lbs} \rightarrow$ $BE = 424 \text{ lbs @ } 45^\circ \nwarrow$ $C_x = 300 \text{ lbs} \rightarrow$
 $A_y = 150 \text{ lbs} \downarrow$ $C_y = 150 \text{ lbs} \downarrow$ All on $ABCD$