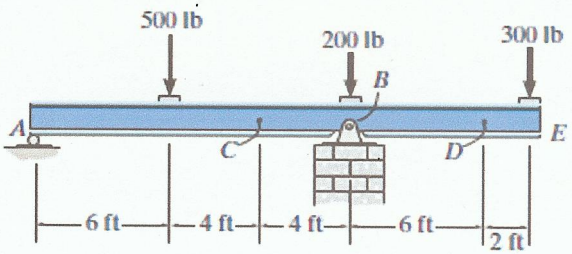
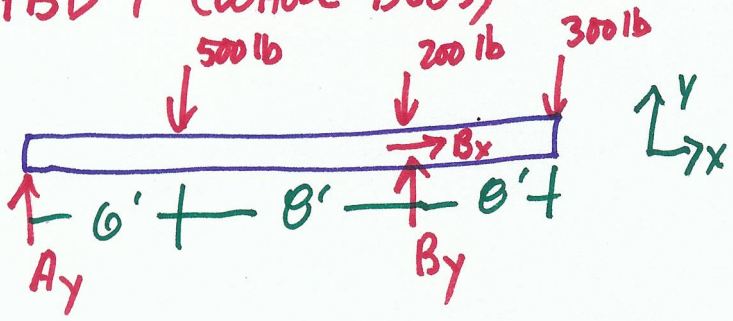
7–1.

Determine the shear force and moment at points C and D.

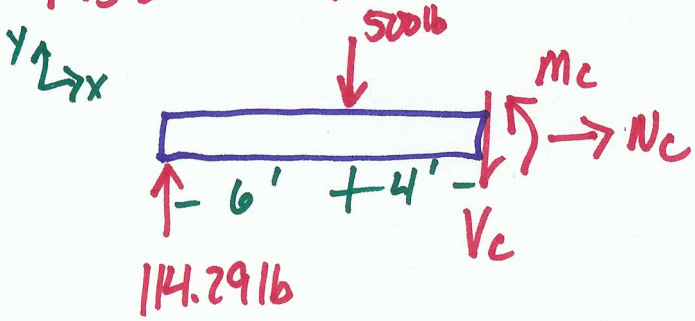


FBD 1 (WHOLE BODY)



$\circlearrowleft \Sigma M_B = 0 \qquad 14A_y - 8(500) + 8(300) = 0 \qquad A_y = 114.29\text{ lb}$

FBD 2 (LEFT OF C)



$\rightarrow \Sigma F_x = 0 \qquad N_C = 0$

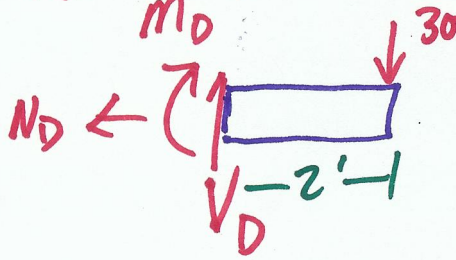
$\uparrow \Sigma F_y = 0 \qquad 114.29 - 500 - V_C = 0$

$V_C = -386 = 386\text{ lb} \uparrow$ ON AC

$\circlearrowleft \Sigma M_C = 0 \qquad 114.29(10) - 500(4) - M_C = 0$

$M_C = -857 = 857\text{ Ft-lb}$ CW ON AC

FBD 3 (RIGHT OF D)



$\rightarrow \Sigma F_x = 0 \qquad N_D = 0$

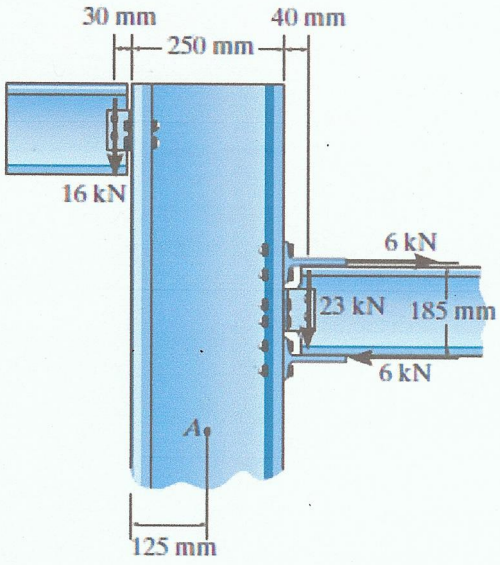
$\uparrow \Sigma F_y = 0 \qquad V_D - 300 = 0 \qquad V_D = 300\text{lb} \uparrow$ ON DE

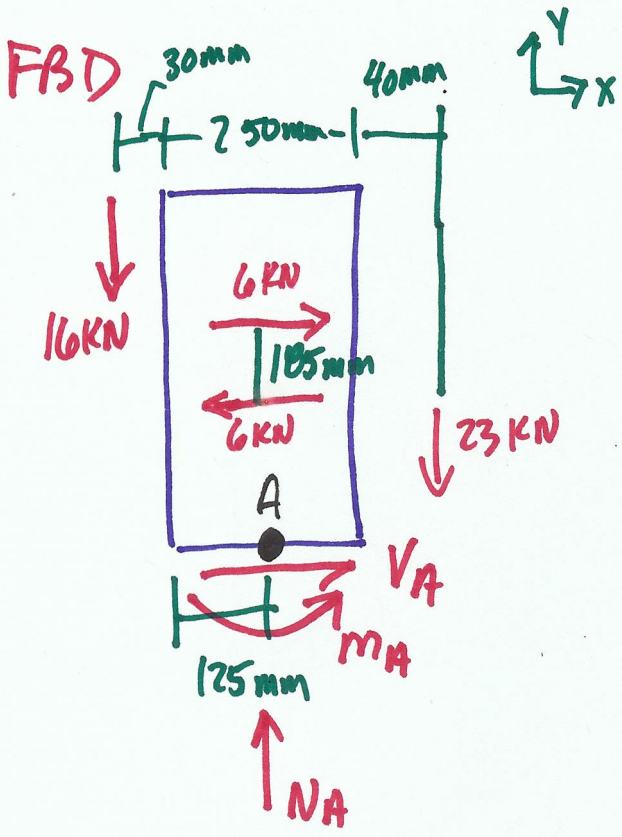
$\circlearrowleft \Sigma M_D = 0 \qquad M_D + 2(300) = 0$

$M_D = -600 = 600\text{lb-Ft}$ CCW ON DE

7–3.

Two beams are attached to the column such that structural connections transmit the loads shown. Determine the internal normal force, shear force, and moment acting in the column at a section passing horizontally through point A.





$\rightarrow \Sigma F_x = 0$ $\quad 6 - 6 + V_A = 0$ $\quad V_A = 0$

$\uparrow \Sigma F_y = 0$ $\quad -16 - 23 + N_A = 0$ $\quad N_A = 39\ \text{KN} \uparrow$ ON UPPER BODY

$\circlearrowleft \Sigma M_A = 0$ $\quad -16(155) + 23(165) + 6(185) - M_A = 0$

$M_A = 2425$

$M_A = 2.43\ \text{KN m}$

CCW ON UPPER BODY