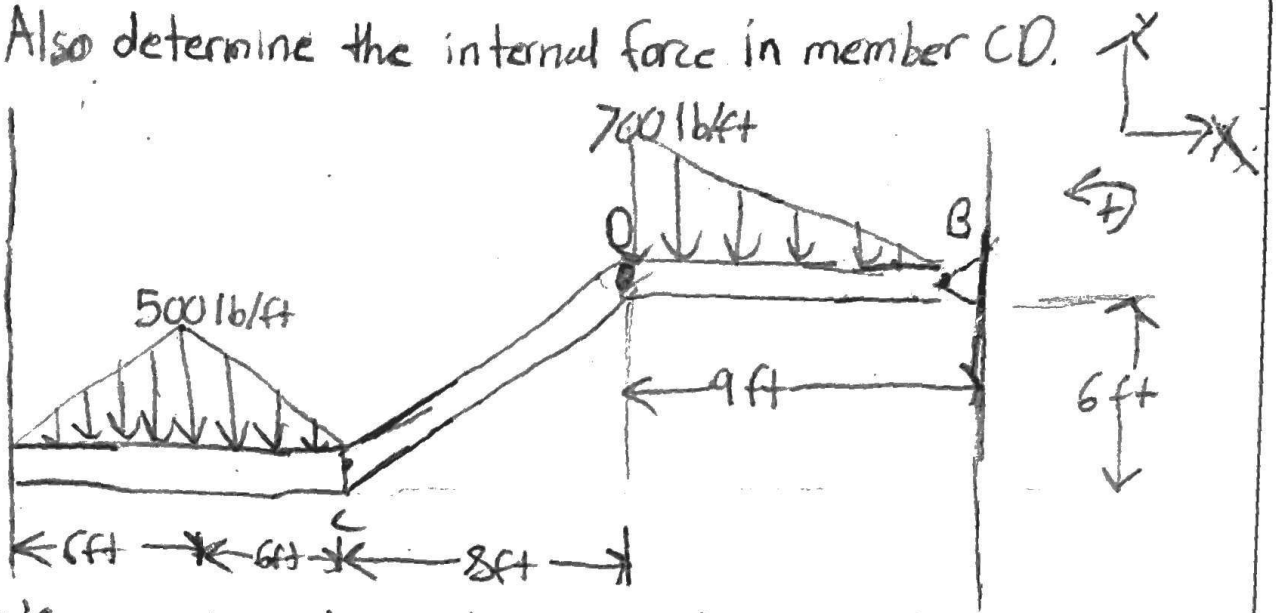
Homework #1b | MEGN 212 A | Anthony Perez

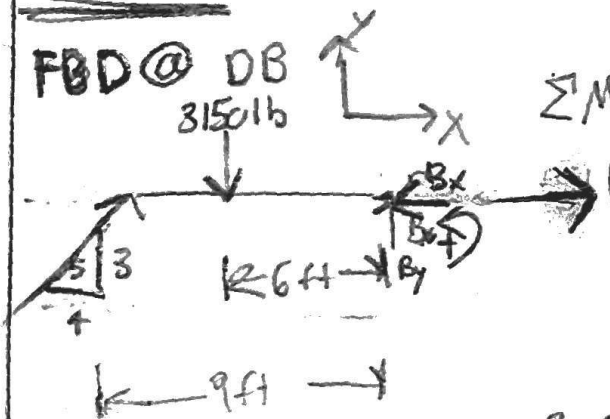
Given: Determine the reactions at supports A and B. Also determine the internal force in member CD.



Find: Support reactions at supports A and B. Also find the interforce at member CD.

Solution:

FBD @ DB



$\frac{1}{2}(700\ lb/ft)(9\ ft) = 3150\ lb$

$\Sigma M_B = 0$

$\left(\frac{3}{5}\right)(F_{CD})(9\ ft) = 3150\ lb\,(6\ ft)$

$F_{CD} = -3.5\ kip$

$= -3.50\ kip$ | compression at CD

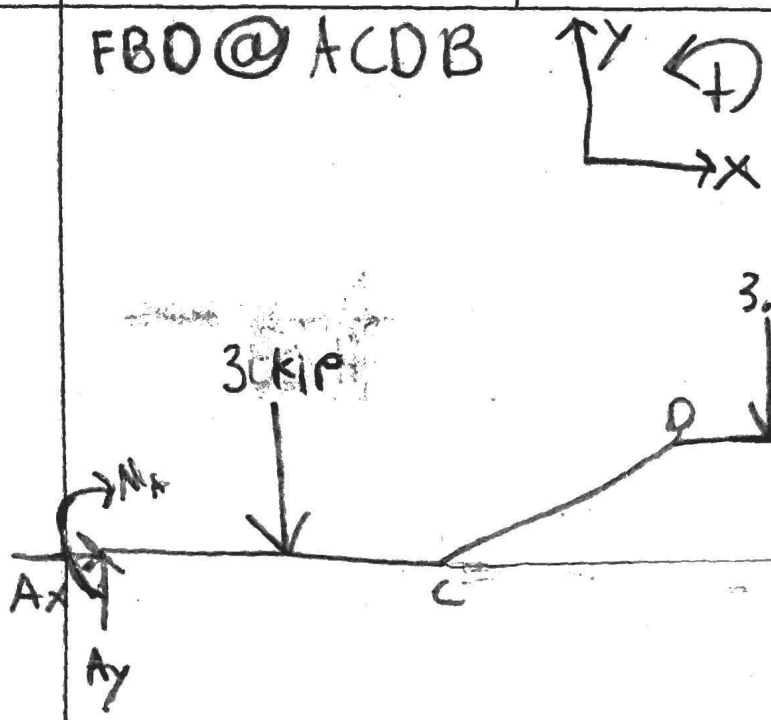
$\Sigma F_y = 0 = B_y - 3150\ lb + \frac{3}{5}(3500\ lb)$

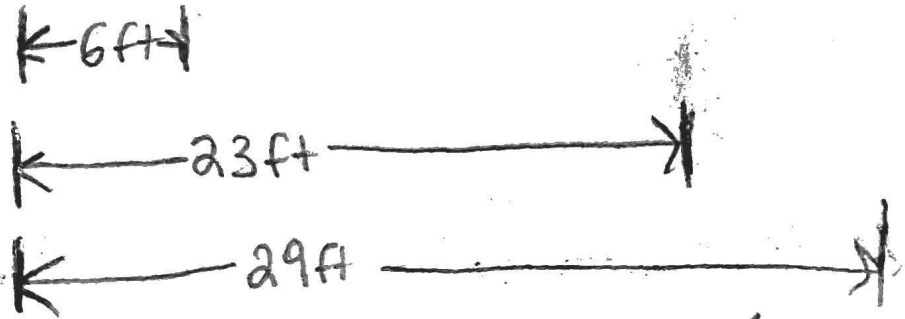
$B_y = 1.05\ kip\ \uparrow$

$\Sigma F_x = 0 = \frac{4}{5}(3500\ lb) - B_x$

$B_x = 2.80\ kip\ \leftarrow$

FBD @ ACDB





$\sum M_A = 0 = -M_A - (3\,kip)(6ft) - (3.15\,kip)(23ft) + (1.05k)(29ft)$

$$\boxed{M_A = 60.0\,kip \cdot ft \circlearrowleft}$$

$\sum F_x = A_x - 2.8\,kip$

$$\rightarrow \boxed{A_x = 2.80\,kip \rightarrow}$$

$\sum F_y = A_y - 3kip - 3.15\,kip + 1.05\,kip$

$$\boxed{A_y = 5.10\,kip \uparrow}$$