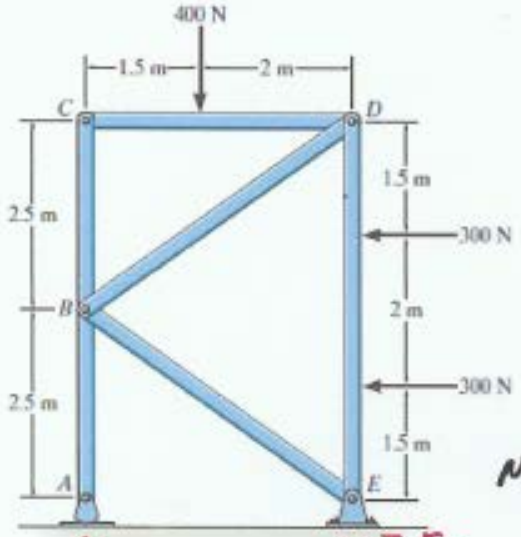
Engineering Mechanics – Statics Worksheets

Problem 3 - Frames II

Determine the horizontal and vertical components of force which pins *A*, *B* and *C* exert on member *ABC* of the frame.



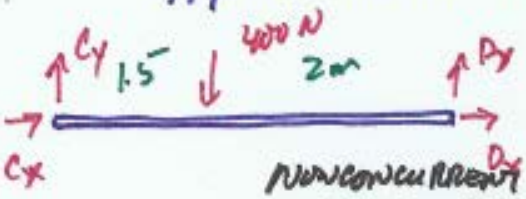
NONCONCURRENT
3 EQNS, 3 UNKS

A_y E_y E_x

$\circlearrowleft \Sigma M_E = 0$

$3.5A_y - 400(2) - 300(3.5) - 300(1.5) = 0$

$A_y = 657\ N \uparrow$

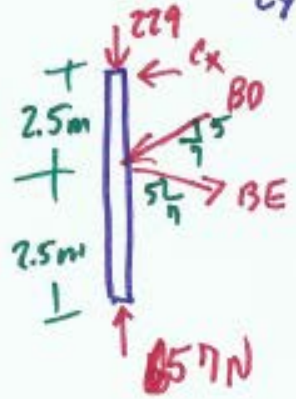


NONCONCURRENT
3 EQNS, 4 UNKS

$\circlearrowleft \Sigma M_D = 0$

$3.5C_y - 2(400) = 0$

$C_y = 229\ N \uparrow$ on CD



$\circlearrowleft \Sigma M_B = 0$

$C_x = 0$

$\rightarrow \Sigma F_x = 0$

FBD = FBE

$\uparrow \Sigma F_y = 0$

$-229 + 657 - 2\frac{5}{\sqrt{74}} BD = 0$

$BD = 368\ N$

$B_x = 0$

$B_y = \frac{5}{\sqrt{74}}(368)(2) = 428\ N \downarrow$