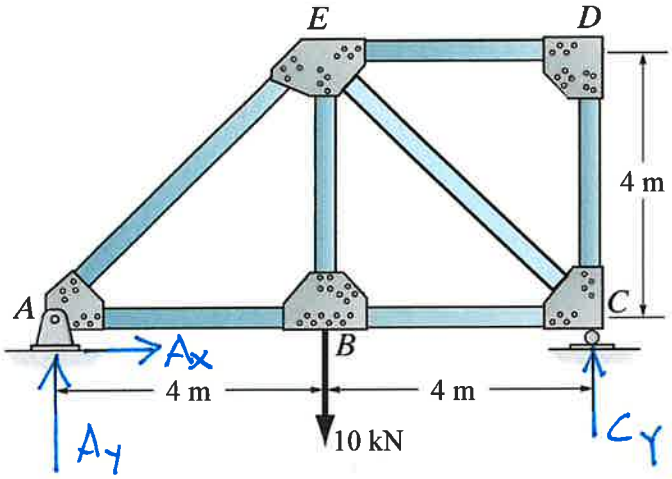
CIVL 3121 Quiz #2 S23

Name: SOLUTION

Determine the all the bar forces in truss.



$$\circlearrowleft +\sum M_A = 0 = -10\,kN(4m) + C_y(8m)$$

$$C_y = 5\,kN$$

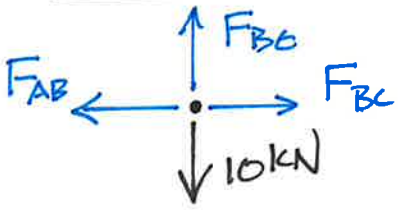
$$+\uparrow \sum F_y = 0 = A_y + C_y - 10\,kN$$

$$A_y = 5\,kN$$

$$\xrightarrow{+} \sum F_x = 0 = A_x$$

$F_{CD} = 0$, $F_{DE} = 0$ } CASE 1 - ZERO FORCE MEMBERS

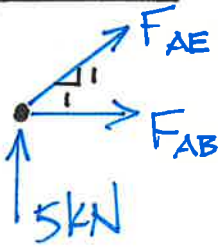
JOINT B



$$+\uparrow \sum F_y = 0 = F_{BE} - 10\,kN$$

$$F_{BE} = 10\,kN$$

JOINT A



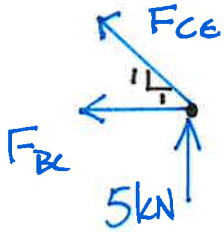
$$+\uparrow \sum F_y = 0 = \frac{1}{\sqrt{2}} F_{AE} + 5\,kN$$

$$F_{AE} = -7.07\,kN$$

$$\xrightarrow{+} \sum F_x = 0 = F_{AB} + \frac{1}{\sqrt{2}} F_{AE}$$

$$F_{AB} = 5\,kN$$

JOINT C



$$+\uparrow \sum F_y = 0 = \frac{1}{\sqrt{2}} F_{CE} + 5\,kN$$

$$F_{CE} = -7.07\,kN$$

$$\xrightarrow{+} \sum F_x = 0 = -F_{BC} - \frac{1}{\sqrt{2}} F_{CE}$$

$$F_{BC} = 5\,kN$$