EGR 180 7/8/10

Note Title 7/8/2010

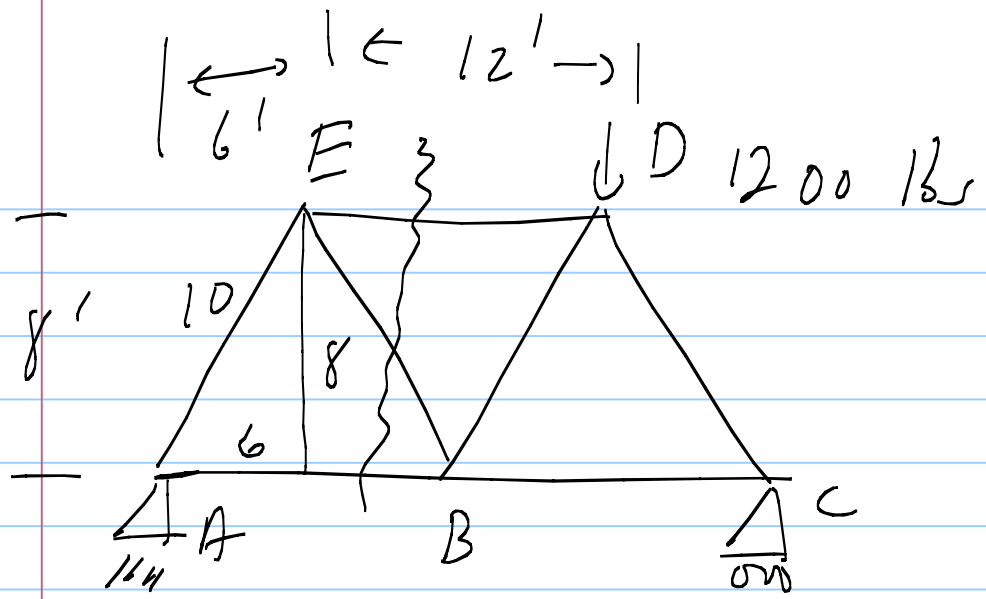
Trusses

Method of Joints

Method of Sections

At least 1 3D problem

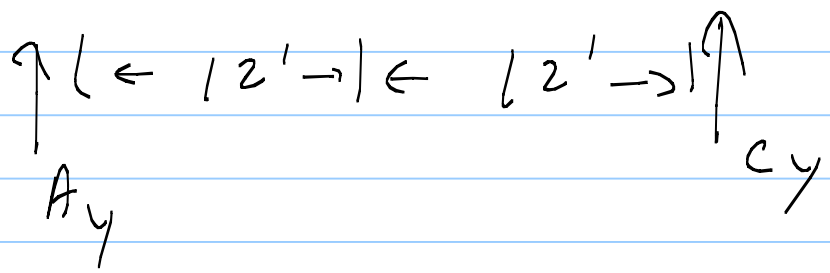
Frame

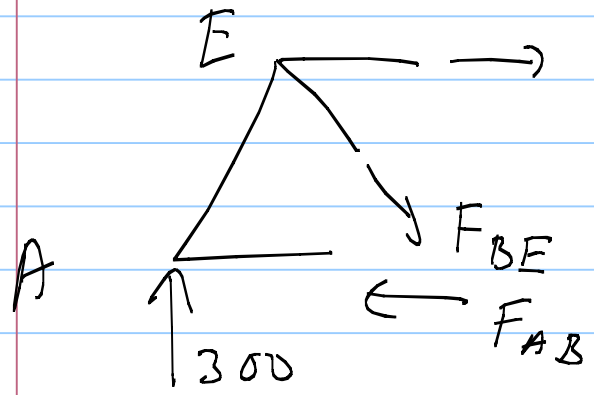


F_{DE}, F_{BE}, F_{AB}

$\sum M_B \Rightarrow C_y = 900$ lbs

$\Rightarrow A_y = 300$ lbs





$\sum M_E = -8 F_{AB} - 6 \cdot 300 = 0$

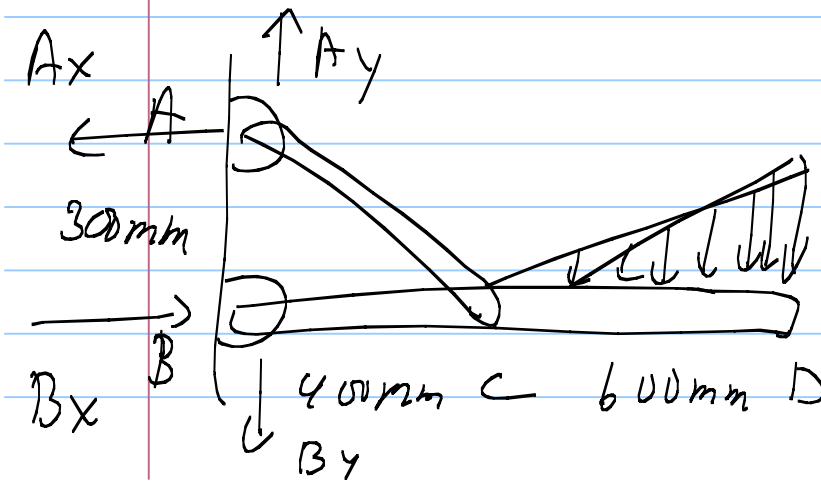
$F_{AB} = -\frac{1800}{8} = -225$ lbs

$$\sum M_B = -12.300 - 8 \cdot F_{DE} = 0$$

$$F_{DE} = -\frac{3600}{8} = -450 \text{ lbs}$$

$$\sum F_y = 300 - .8 F_{BE} = 0$$

$$F_{BE} = 375 \text{ lbs}$$



600 N/m

$$F = \frac{1}{2}(600)(.6) = 180 \text{ N}$$

$$X_B = .8 \text{ m}$$

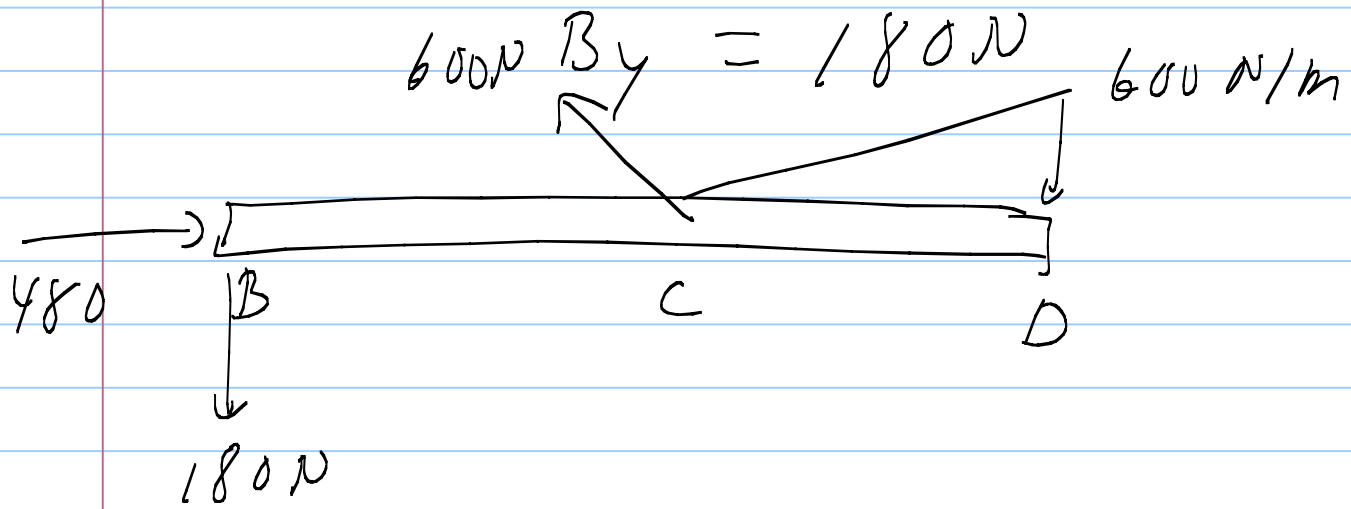
$$\sum M_B = .3 A_x - (.8)\,180 = 0$$

$$A_x = 480\,N$$

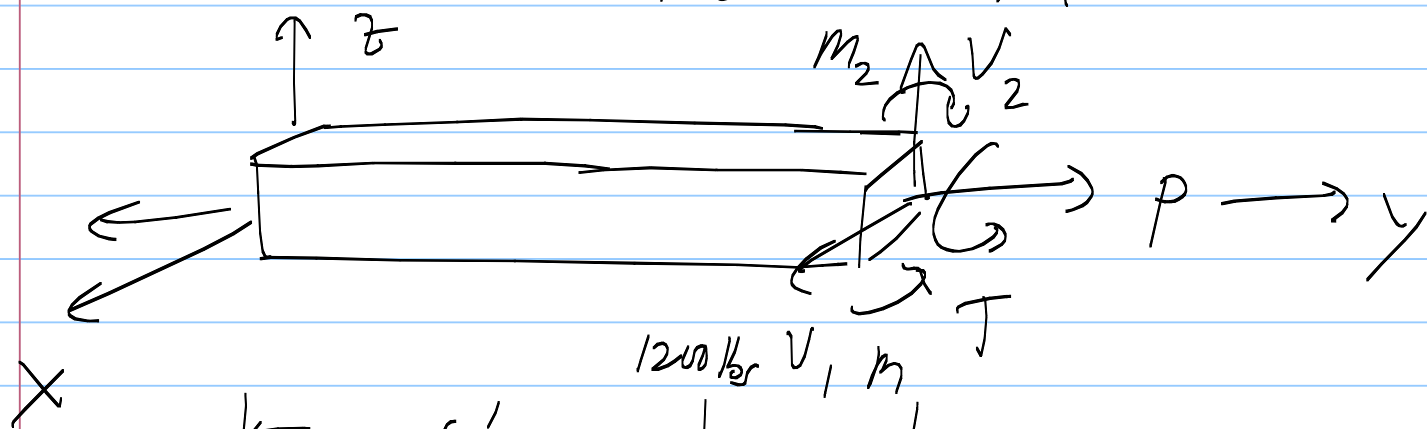
$$\sum F_x = 0 \quad B_x = 480\,N$$

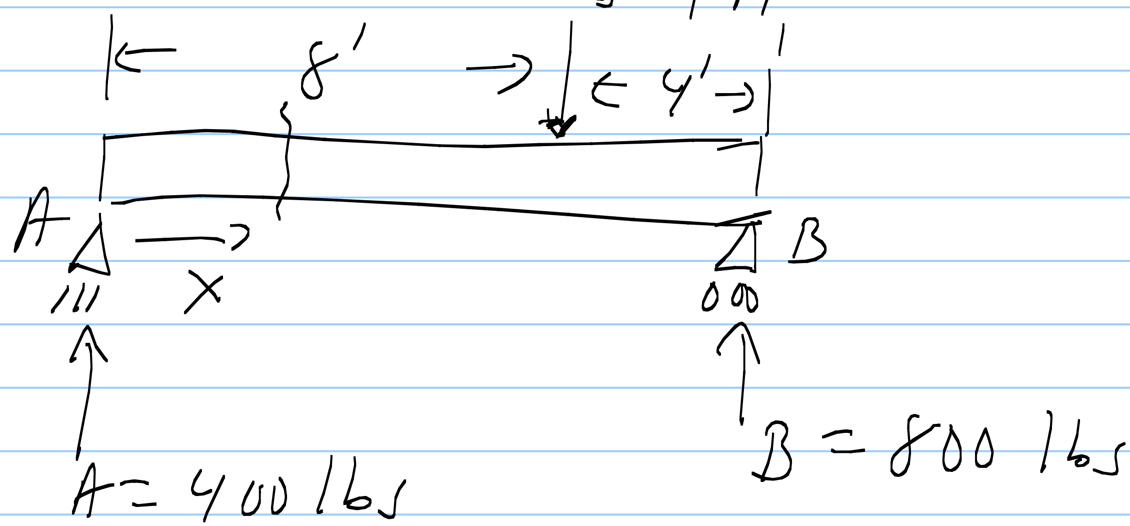
$$A_y = 360\,N$$

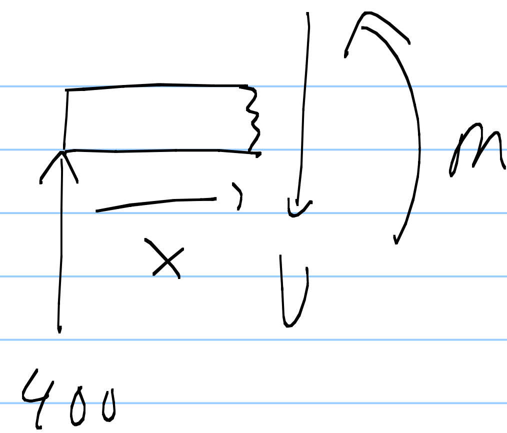
$$B_y = 180\,N$$



Internal Forces in a Member







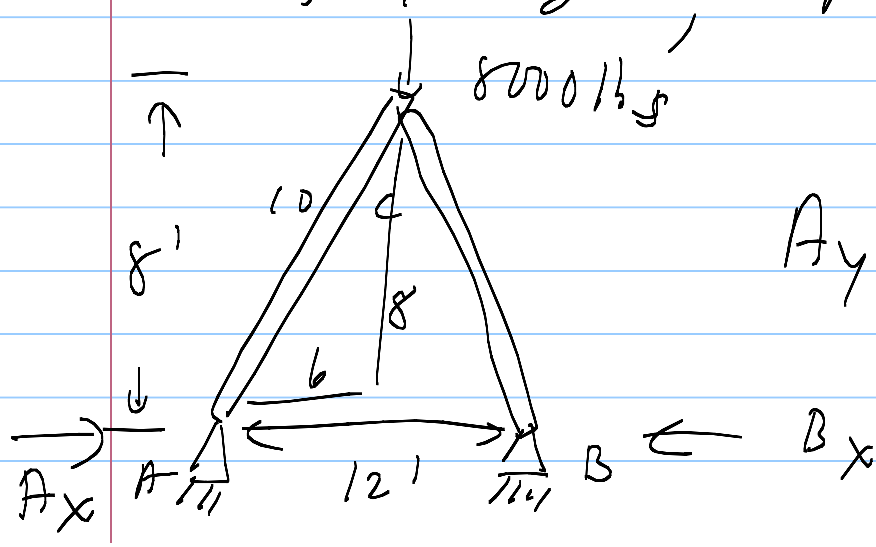
$$\Sigma F_y = 400 - V = 0$$

$$V = 400 \text{ lbs}$$

$$\Sigma M_A = -400x + m = 0$$

$$m = 400x$$

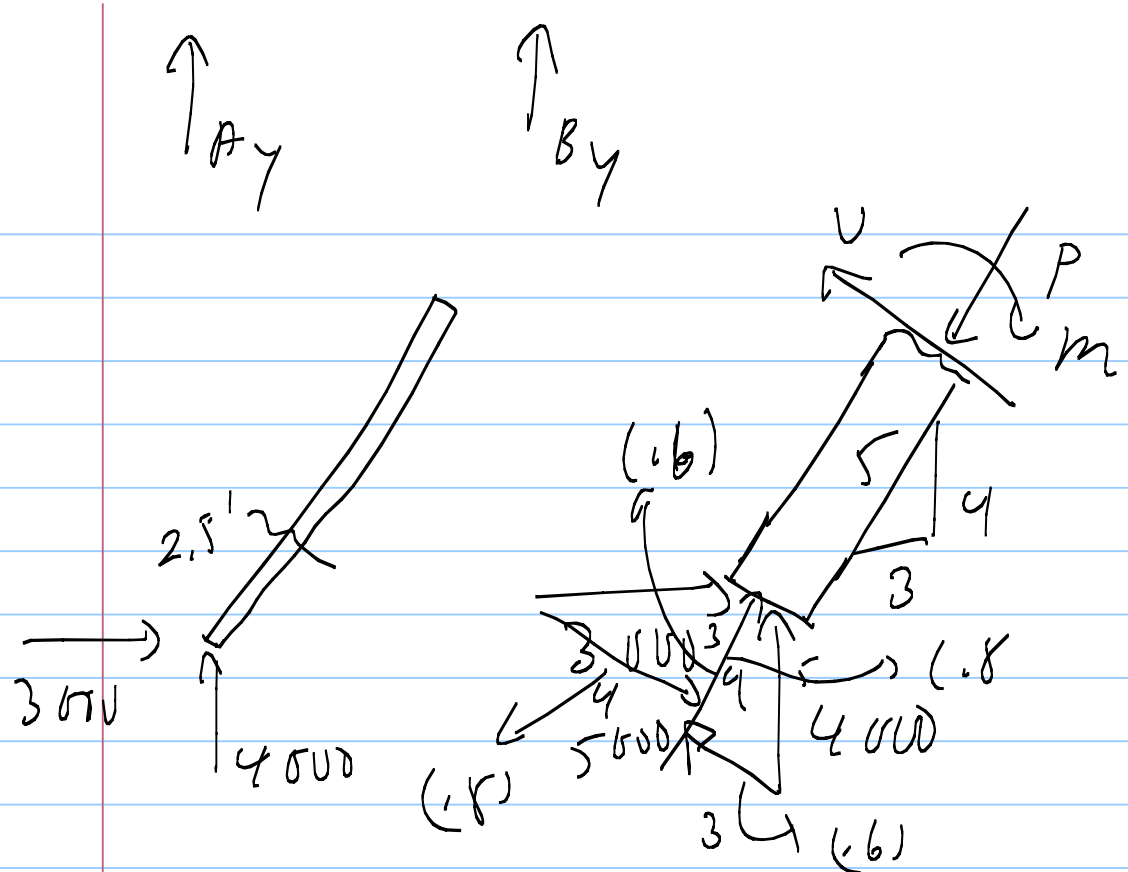
If $x = 2'$, $m = 800$ ft.lbs



$$A_y = B_y = 4000 \text{ lbs}$$

$$\frac{A_x}{A_y} = \frac{3}{4} \Rightarrow A_x = 3000 \text{ lbs}$$

$$B_x = 3000 \text{ lbs}$$



$V = 0$

$P = 5000$ lbs

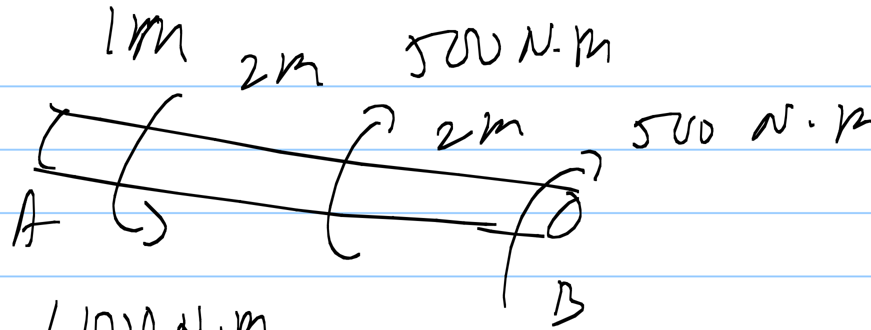
$m = 0$

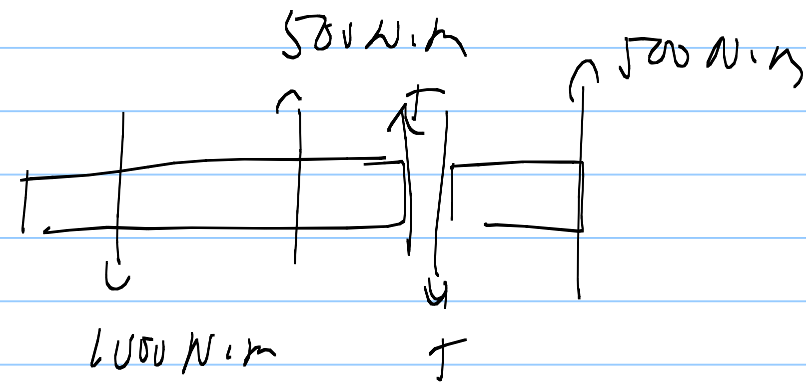
$V = -(3000)(.8) + 4000(.6) = -2400 + 2400$

$= 0$

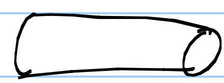
$P = (.8)\,4000 + (.6)\,3000 = 3200 + 1800$

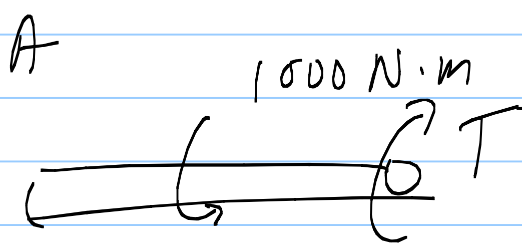
$= 5000$ lbs



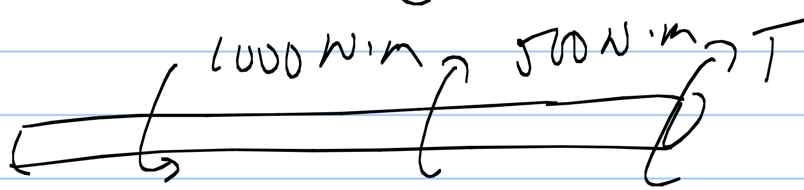


A: .5m, 2m, 4m

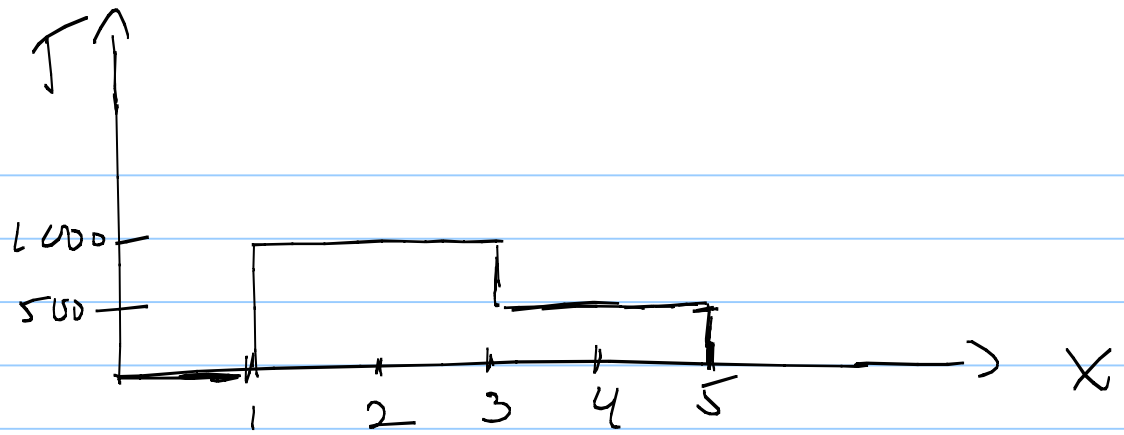
.5m  $T = 0$

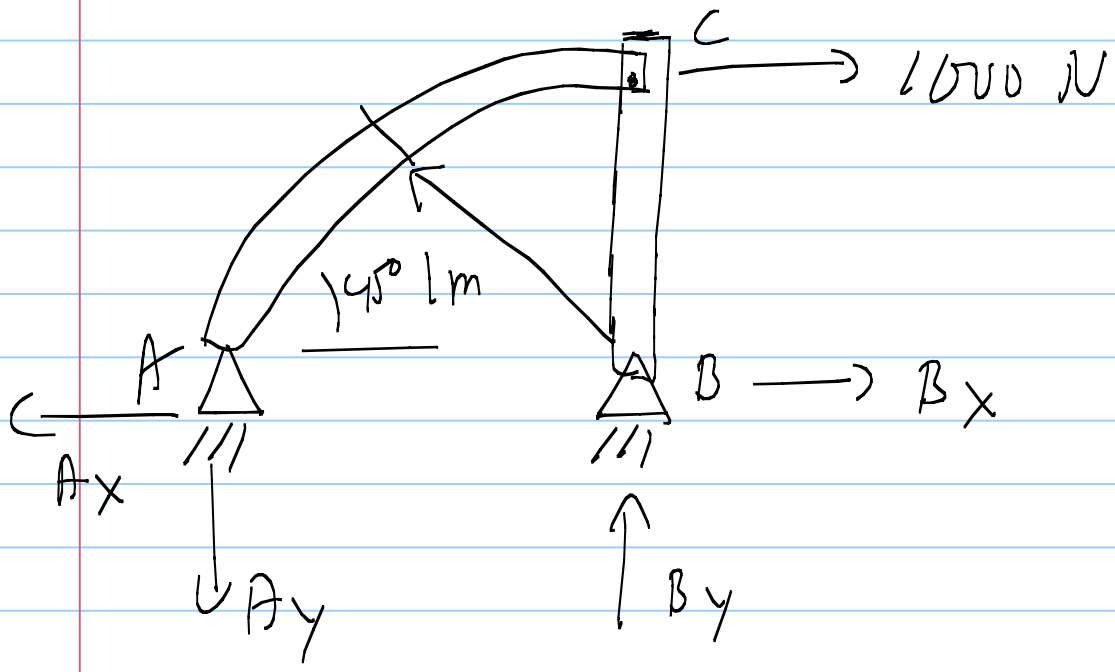


2m $\sum M = 0 \Rightarrow T = 1000\ N.m$



4m $\sum M = 0 \Rightarrow T = 500\ N.m$



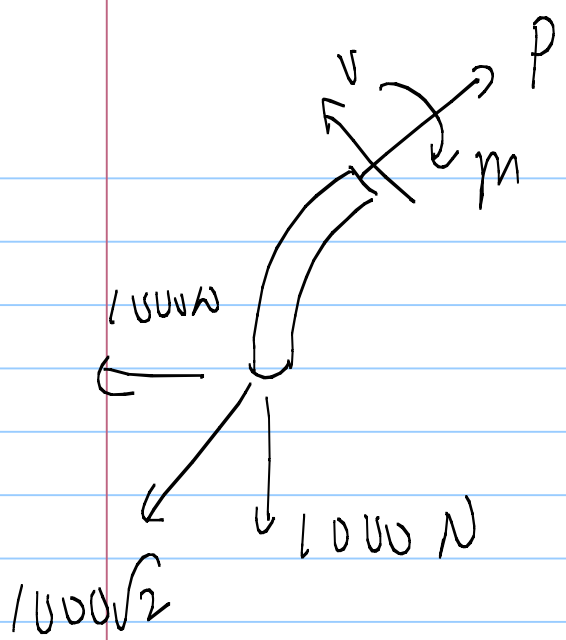


$\sum M_B \Rightarrow A_y = 1000N$

$\sum F_y \Rightarrow B_y = 1000N$

$A_x = 1000\ N$

$B_x = 0\ N$



$$\sum F_A = -1000\sqrt{2} + P = 0$$

$$P = 1000\sqrt{2}\ N$$

$$\sum F_V = 0 = V$$

$$\sum m_B = -1 \cdot P + 1000 \cdot 1 - m = 0$$

$$m = 1000 - 1000\sqrt{2}$$

$$= 1000(1-\sqrt{2})\ N \cdot m$$