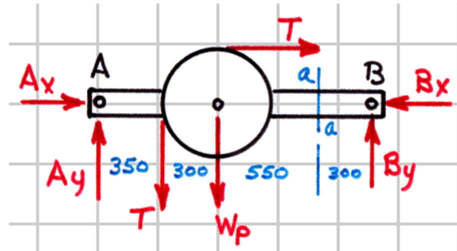
1-84

$$T = W = 100(9.81) = 981 \text{ N}$$

$$W_P = 50(9.81) = 490.50 \text{ N}$$

First draw a free-body diagram of the arm *AB* and the pulley. The moment equation of equilibrium gives

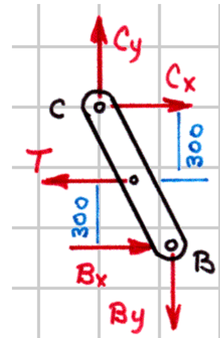


$\circlearrowleft \Sigma M_A = 0:$

$$1500B_y - 300(981) - 350(981) - 650(490.5) = 0$$

$$B_y = 637.650 \text{ N}$$

Next, from a free-body diagram of the bar *BC*, the equations of equilibrium give



$\rightarrow \Sigma F_x = 0: \quad C_x - (981) + B_x = 0$

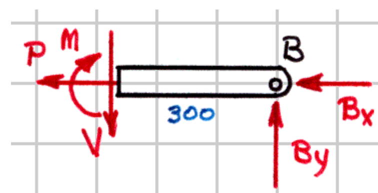
$\uparrow \Sigma F_y = 0: \quad C_y - (637.5) = 0$

$\circlearrowleft \Sigma M_C = 0: \quad 600B_x - 300(981) - 300(637.650) = 0$

$$B_x = 809.325 \text{ N}$$

$$C_x = 171.675 \text{ N} \qquad C_y = 637.650 \text{ N}$$

Finally, from a free-body diagram of the right end of bar *AB*, the equations of equilibrium give



$\rightarrow \Sigma F_x = 0: \quad -P - (809.325) = 0$

$\uparrow \Sigma F_y = 0: \quad (637.650) - V = 0$

$\circlearrowleft \Sigma M_B = 0: 300(637.650) - M = 0$

$P = -809 \text{ N} = 809 \text{ N (C)}$ .... **Ans.**

$V = 638 \text{ N}$ .... **Ans.**

$M = 191.3 \text{ N} \cdot \text{m}$ .... **Ans.**