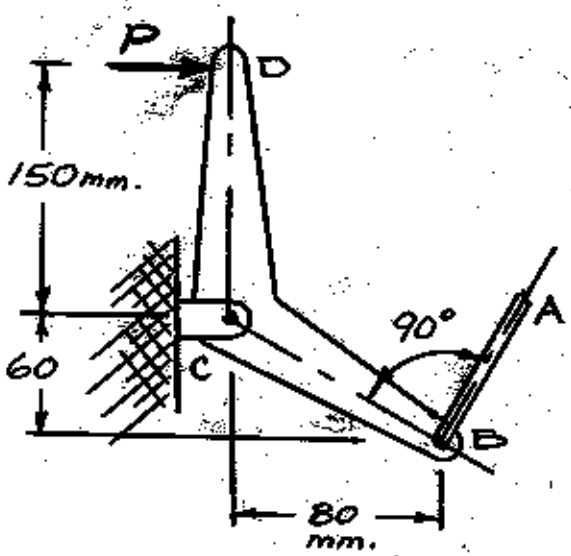
MILANO MECH 234 & 235 PROB. 4.19 P. 169



LEVER BCD IS ONE UNIT ATTACHED TO ROD AB

FORCE, $P = 400^N$. APPLIED AT D

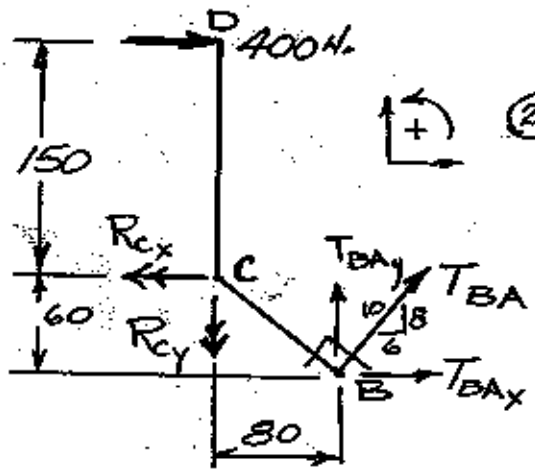
a.) determine T_{BA}

b.) determine R_c

① ROD AB ⊥ BC

∴ T_{BA} PRODUCES $M_C = (T_{BA})(\overline{BC})$

$\overline{BC} = \sqrt{60^2 + 80^2} = 100\ mm.$



② $\Sigma M_C = 0$, pt. C is a hinge

$-(400^N)(150\ mm) + (T_{BA})(100\ mm) = 0$

$\frac{(400)(150)}{100} = T_{BA}$

$\boxed{T_{BA} = 600^N}$

③ $\Sigma F_x = 0$ and $\Sigma F_y = 0$

$\Sigma F_x = 0 = 400^N - R_{Cx} + T_{BA_x}$ where $T_{BA_x} = \frac{6}{10} T_{BA}$

$\therefore R_{Cx} = 400^N + .6(600^N)$

$\boxed{R_{Cx} = 760^N \leftarrow}$

POSITIVE ANS., DIR. ASSUMED CORRECT

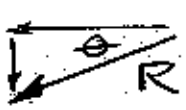
$\Sigma F_y = 0 = -R_{Cy} + T_{BA_y}$ where $T_{BA_y} = \frac{8}{10} T_{BA}$

$\therefore R_{Cy} = .8(600^N)$

$\boxed{R_{Cy} = 480^N \downarrow}$

POSITIVE ANS., DIR. ASSUMED CORRECT

$R_c = \sqrt{760^2 + 480^2} = 898.89^N$



$\theta = \tan^{-1}\frac{-480}{-760} = 32.3°$

$+180$

$212.3°$

$\boxed{R_c = 899.3^N \angle 212.3°}$