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Section =

B

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Solution:

$$\Sigma F_x = 0: 360 - 240 \sin \theta + T \sin 30^\circ + 400 \cos 30^\circ = 0 \quad (1)$$

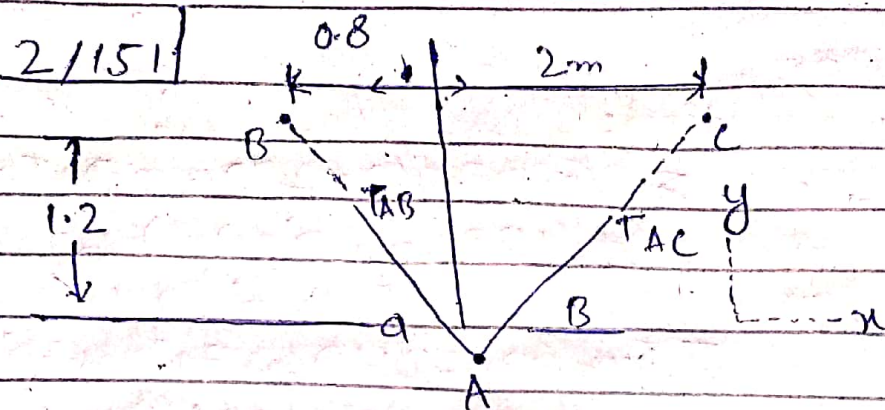
$$\Sigma F_y = 600: 240 \cos \theta + T \cos 30^\circ + 400 \sin 30^\circ = 600 \quad (2)$$

Numerical solution of Eqs (1) and (2)

$$\theta = 21.7^\circ, T = 204 \text{ lb}$$

(We could eliminate T between eqs (1) and (2).

But the resulting equation is still transcendental).



$$\alpha = \tan^{-1}\left(\frac{1.2}{0.8}\right)$$

$$= 56.3^\circ$$

$$= \tan^{-1}\left(\frac{1.2}{2}\right)$$

$$= 31.0$$

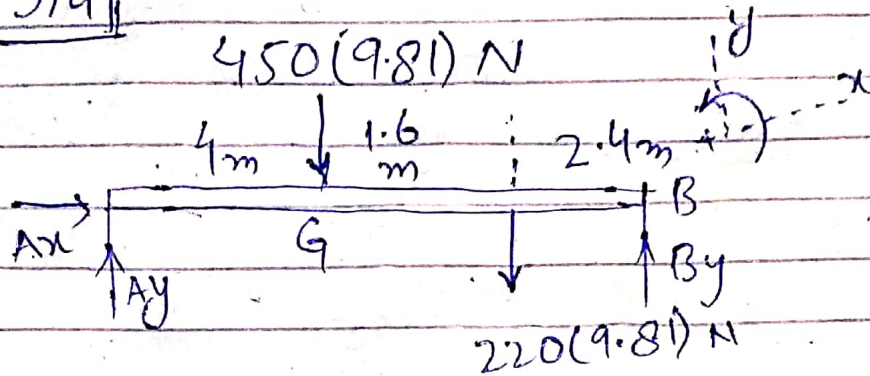
$$\underline{T}_{AB} = T_{AB} \underline{n}_{AB} = 0.858(60)(9.81) [\cos 56.3^\circ \underline{i} + \sin 56.3^\circ \underline{j}]$$

$$= -280 \underline{i} + 420 \underline{j} \text{ N}$$

$$\underline{T}_{AC} = T_{AC} \underline{n}_{AC} = 0.555(60)(9.81) [\cos 31.0^\circ \underline{i} + \sin 31.0^\circ \underline{j}]$$

$$= 280 \underline{i} + 168.1 \underline{j} \text{ N}$$

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$$\text{From } \Sigma F_x = 0, \quad A_x = 0$$

$$\begin{aligned} \Sigma M_A = 0 &: -450(9.81)4 - 220 \\ & (9.81)(5.6) + 8y(8) = 0, \\ B_y &= 3720 \text{ N} \end{aligned}$$

$$\begin{aligned} \Sigma F_y = 0 &: A_y - 450(9.81) - 220 \\ & (9.81) + 3720 = 0 \\ A_y &= 2850 \text{ N} \end{aligned}$$