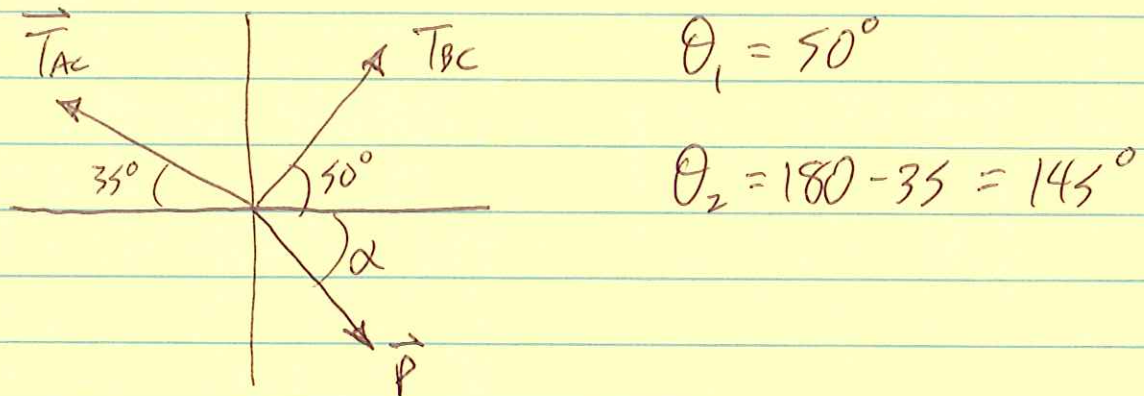


PROB. 2.57

$$T_{AC} = T_{BC} = T_{\max} = 800 \text{ N}, \text{ FIND } P_{\max}, \alpha$$



$$\vec{T}_{BC} = (800 \cdot \cos 50^\circ) \hat{i} + (800 \cdot \sin 50^\circ) \hat{j}$$

$$\vec{T}_{BC} = (514) \hat{i} + (613) \hat{j} \text{ N}$$

$$\vec{T}_{AC} = (800 \cdot \cos 145^\circ) \hat{i} + (800 \cdot \sin 145^\circ) \hat{j}$$

$$\vec{T}_{AC} = (-655) \hat{i} + (459) \hat{j} \text{ N}$$

$$\vec{P} = (P \cos \alpha) \hat{i} + (-P \sin \alpha) \hat{j} \text{ N}$$

$$\sum F_x = 0: 514 - 655 + P \cos \alpha = 0$$

$$P \cos \alpha = 141$$

$$\sum F_y = 0: 613 + 459 - P \sin \alpha = 0$$

PROB. 2.57 CONT.

(2)

$$P \sin \alpha = 1072$$

$$\frac{P \sin \alpha}{P \cos \alpha} = \frac{1072}{141}$$

$$\tan \alpha = 7.603$$

$$\alpha = \tan^{-1}(7.603) = 82.5^\circ$$

$$P = \frac{141}{\cos 82.5^\circ} = 1081 \text{ N}$$