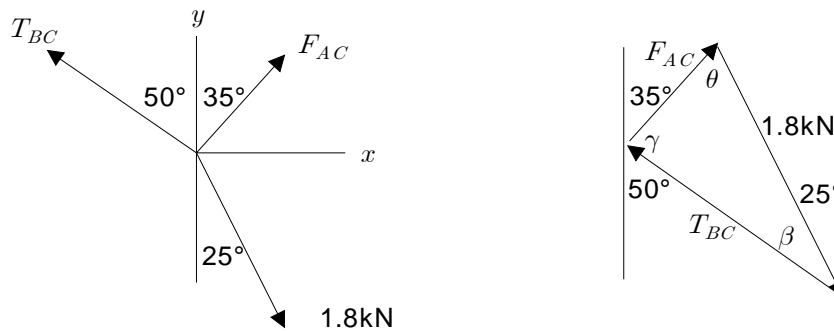


<2.9~2.11 >

2.45



[1]

$$\beta = 50^\circ - 25^\circ = 25^\circ, \quad \gamma = 180^\circ - (35^\circ + 50^\circ) = 95^\circ, \quad \theta = 35^\circ + 25^\circ = 60^\circ$$

$$\text{sine} \quad \frac{\sin 25^\circ}{F_{AC}} = \frac{\sin 95^\circ}{1.8 \text{ kN}} = \frac{\sin 60^\circ}{T_{BC}}$$

$$(a) \quad \frac{\sin 25^\circ}{F_{AC}} = \frac{\sin 95^\circ}{1.8 \text{ kN}} \quad F_{AC} = (1.8 \text{ kN}) \frac{\sin 25^\circ}{\sin 95^\circ} = 0.76362 \text{ kN}$$

$$F_{AC} = 0.764 \text{ kN}$$

$$(b) \quad \frac{\sin 95^\circ}{1.8 \text{ kN}} = \frac{\sin 60^\circ}{T_{BC}} \quad T_{BC} = (1.8 \text{ kN}) \frac{\sin 60^\circ}{\sin 95^\circ} = 1.5648 \text{ kN}$$

$$T_{BC} = 1.564 \text{ kN}$$

[2]

$$F_x = 0$$

$$F_{AC} \sin 35^\circ - T_{BC} \sin 50^\circ + (1.8 \text{ kN}) \sin 25^\circ = 0$$

$$0.5736 F_{AC} - 0.7660 T_{BC} = -0.7607 \text{ kN} \quad \dots$$

$$F_y = 0$$

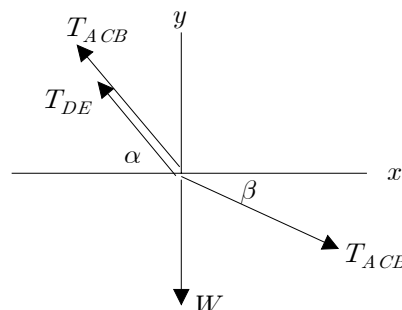
$$F_{AC} \cos 35^\circ + T_{BC} \cos 50^\circ - (1.8 \text{ kN}) \cos 25^\circ = 0$$

$$0.8192 F_{AC} + 0.6428 T_{BC} = 1.6314 \text{ kN} \quad \dots$$

$$0.6428 \times \quad + 0.7660 \times \quad \quad \quad F_{AC} = 0.764 \text{ kN}$$

$$0.8192 \times \quad - 0.5736 \times \quad \quad \quad T_{BC} = 1.564 \text{ kN}$$

2.56



$$\alpha = 42^\circ$$

$$\beta = 32^\circ$$

$$T_{DE} = 20 \text{ kN}$$

$$(b) \quad F_x = 0$$

$$T_{ACB} \cos \beta - (T_{ACB} + T_{DE}) \cos \alpha = 0$$

$$T_{ACB} = \frac{\cos \alpha}{\cos \beta - \cos \alpha} T_{DE} = \frac{\cos 42^\circ}{\cos 32^\circ - \cos 42^\circ} (20 \text{ kN}) = 141.68 \text{ kN}$$

$$T_{ACB} = 141.7 \text{ kN}$$

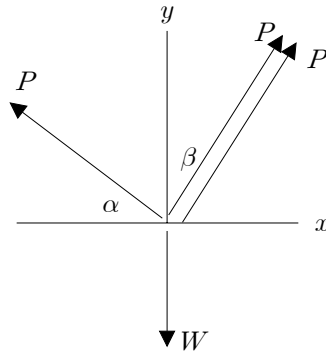
$$(a) \quad F_y = 0$$

$$-T_{ACB} \sin 32^\circ + (T_{ACB} + T_{DE}) \sin 42^\circ - W = 0$$

$$W = - (141.68 \text{ kN}) \sin 32^\circ + [(141.68 \text{ kN}) + (20 \text{ kN})] \sin 42^\circ \\ = 33.11 \text{ kN}$$

$$W = 33.1 \text{ kN}$$

2.69



$$W = 1.6 \text{ kN}, \quad \beta = 25^\circ$$

$$F_x = 0$$

$$2P \sin \beta - P \cos \alpha = 0$$

$$\cos \alpha = 2 \sin 25^\circ = 0.8452 \quad \alpha = \pm 32.30^\circ$$

$$(i) \quad \alpha = +32.3^\circ$$

$$F_y = 0$$

$$2P \cos \beta + P \sin \alpha - W = 0$$

$$P = \frac{W}{2 \cos \beta + \sin \alpha} = \frac{1.6 \text{ kN}}{2 \cos 25^\circ + \sin 32.3^\circ} = 0.6817 \text{ kN}$$

$$P = 0.682 \text{ kN} \quad \underline{+32.3^\circ}$$

$$(ii) \quad \alpha = -32.3^\circ$$

$$P = \frac{W}{2 \cos \beta + \sin \alpha} = \frac{1.6 \text{ kN}}{2 \cos 25^\circ - \sin 32.3^\circ} = 1.2517 \text{ kN}$$

$$P = 1.252 \text{ kN} \quad \underline{-32.3^\circ}$$