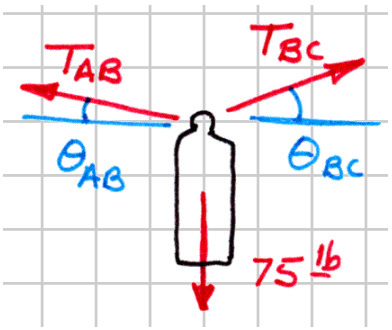
1-47

$$\theta_{AB} = \tan^{-1}\frac{d}{20} \qquad \theta_{BC} = \tan^{-1}\frac{d}{10}$$



From a free-body diagram of the stop light, the equations of equilibrium give

$$\rightarrow \Sigma F_x = 0: \qquad T_{BC}\cos\theta_{BC} - T_{AB}\cos\theta_{AB} = 0$$

$$\uparrow \Sigma F_y = 0: \qquad T_{AB}\sin\theta_{AB} + T_{BC}\sin\theta_{BC} - 75 = 0$$

Solving yields

$$T_{AB} = \frac{75\cos\theta_{BC}}{\sin\theta_{BC}\cos\theta_{AB} + \cos\theta_{BC}\sin\theta_{AB}}$$

$$T_{BC} = \frac{75\cos\theta_{AB}}{\sin\theta_{BC}\cos\theta_{AB} + \cos\theta_{BC}\sin\theta_{AB}}$$