$$T_2 \cos\theta_2 = T_1 \cos\theta_1$$

$$T_2 = \frac{T_1 \cos\theta_1}{\cos\theta_2}$$

$$T_1 \sin\theta_1 + \left(\frac{T_1 \cos\theta_1}{\cos\theta_2}\right)\sin\theta_2 = 350$$

$$T_1 \sin\theta_1 + \frac{T_1 \cos\theta_1 \sin\theta_2}{\cos\theta_2} = 350$$

$$T_1 \sin\theta_1 + T_1 \frac{\cos\theta_1 \sin\theta_2}{\cos\theta_2} = 350$$

$$T_1 \left(\sin\theta_1 + \frac{\cos\theta_1 \sin\theta_2}{\cos\theta_2}\right) = 350$$

$$T_1 \left(\frac{\sin\theta_1 \cos\theta_2 + \cos\theta_1 \sin\theta_2}{\cos\theta_2}\right) = 350$$

$$T_1 \left(\frac{\sin(\theta_1 + \theta_2)}{\cos\theta_2}\right) = 350$$

$$T_1 = 350 \left(\frac{\cos\theta_2}{\sin(\theta_1 + \theta_2)}\right)$$

$$T_1 = \frac{350 \cos\theta_2}{\sin(\theta_1 + \theta_2)}$$

$$T_1 = \frac{350 \cos 23.8}{\sin(55.3 + 23.8)}$$

$$T_1 = \frac{350 \cos 23.8}{\sin 79.1}$$

$$T_1 = 326.12 \text{ N}$$

$$T_1 \sin\theta_1 = 350 - T_2 \sin\theta_2$$

$$T_1 = \frac{350 - T_2 \sin\theta_2}{\sin\theta_1}$$

$$-\left(\frac{350 - T_2 \sin\theta_2}{\sin\theta_1}\right)\cos\theta_1 + T_2 \cos\theta_2 = 0$$

$$-\left(\frac{350 \cos\theta_1 - T_2 \sin\theta_2 \cos\theta_1}{\sin\theta_1}\right) + T_2 \cos\theta_2 = 0$$

$$\frac{-350 \cos\theta_1 + T_2 \sin\theta_2 \cos\theta_1}{\sin\theta_1} + T_2 \cos\theta_2 = 0$$

$$\frac{-350 \cos\theta_1}{\sin\theta_1} + \frac{T_2 \sin\theta_2 \cos\theta_1}{\sin\theta_1} + T_2 \cos\theta_2 = 0$$

$$\frac{-350 \cos\theta_1}{\sin\theta_1} + T_2\left(\frac{\sin\theta_2 \cos\theta_1}{\sin\theta_1} + \cos\theta_2\right) = 0$$

$$T_2\left(\frac{\sin\theta_2 \cos\theta_1}{\sin\theta_1} + \cos\theta_2\right) = \frac{350 \cos\theta_1}{\sin\theta_1}$$

$$T_2\left(\frac{\sin\theta_2 \cos\theta_1 + \cos\theta_2 \sin\theta_1}{\sin\theta_1}\right) = \frac{350 \cos\theta_1}{\sin\theta_1}$$

$$T_2\left(\frac{\sin(\theta_2 + \theta_1)}{\sin\theta_1}\right) = \frac{350 \cos\theta_1}{\sin\theta_1}$$

$$T_2 = \frac{350 \cos\theta_1}{\sin\theta_1}\left(\frac{\sin\theta_1}{\sin(\theta_2 + \theta_1)}\right)$$

$$T_2 = \frac{350 \cos\theta_1}{\sin(\theta_2 + \theta_1)}$$

$$T_2 = \frac{350 \cos 55.3}{\sin(23.8 + 55.3)}$$

$$T_2 = 203 \text{ N}$$