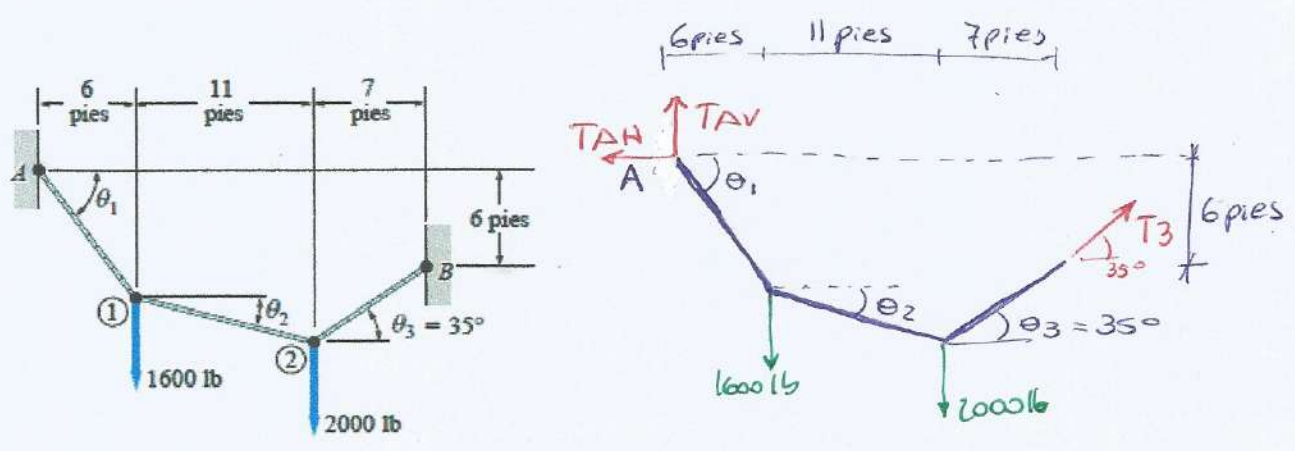


Para el cable cargado como se muestra en la figura, determine los ángulos  $\theta_1$  y  $\theta_2$ , la fuerza en cada segmento y la longitud del cable.



$\sum M_A = 0$

$-T_3 \cdot \sin 35^\circ \cdot 24 \text{ pies} - T_3 \cdot \cos 35^\circ \cdot 6 \text{ pies} + 1600 \text{ lb} \cdot 6 \text{ pies} + 2000 \text{ lb} \cdot 17 \text{ pies} = 0$

$-T_3 \cdot 18,68 \text{ pies} + 9600 \text{ lb} \cdot \text{pies} + 34000 \text{ lb} \cdot \text{pies} = 0$

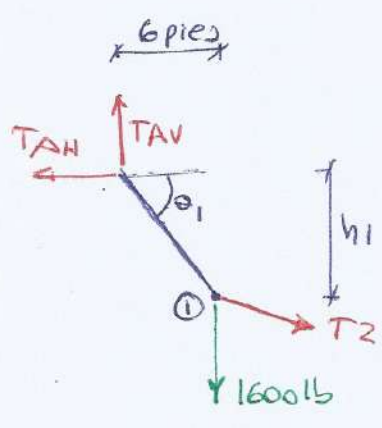
$T_3 = 2334 \text{ lb}$

$\sum F_x = 0 \quad -T_{AH} + T_3 \cdot \cos 35^\circ = 0$

$T_{AH} = 1912 \text{ lb}$

$\sum F_y = 0 \quad T_{AV} - 1600 \text{ lb} - 2000 \text{ lb} + T_3 \cdot \sin 35^\circ = 0$

$T_{AV} = 2261 \text{ lb}$

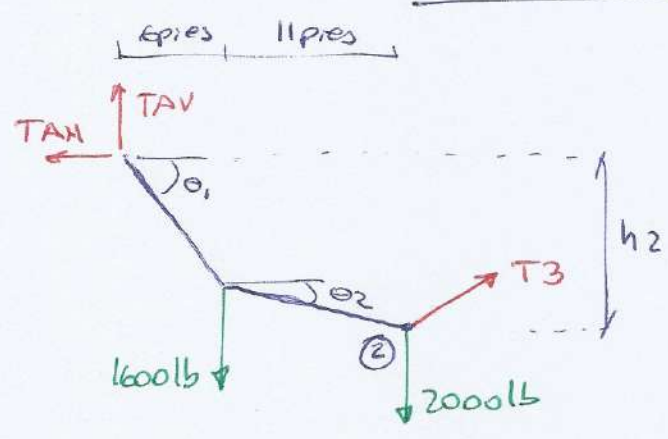


$\sum M_1 = 0$

$-T_{AH} \cdot h_1 + T_{AV} \cdot 6 \text{ pies} = 0$

$h_1 = \frac{2261 \text{ lb} \cdot 6 \text{ pies}}{1912 \text{ lb}} = 7,1 \text{ pies}$

$h_1 = 7,1 \text{ pies}$



$\sum M_2 = 0$

$-T_{AH} \cdot h_2 + T_{AV} \cdot 17 \text{ pies} - 1600 \text{ lb} \cdot 11 \text{ pies} = 0$

$h_2 = \frac{2261 \text{ lb} \cdot 17 \text{ pies} - 1600 \text{ lb} \cdot 11 \text{ pies}}{1912 \text{ lb}}$

$h_2 = 10,9 \text{ pies}$

$$\theta_1 = \arctg\left(\frac{h_1}{6 \text{ pies}}\right)$$

$$\theta_1 = \arctg\left(\frac{7,1 \text{ pies}}{6 \text{ pies}}\right)$$

$$\theta_1 = 49,8^\circ$$

$$\theta_2 = \arctg\left(\frac{h_2 - h_1}{11 \text{ pies}}\right)$$

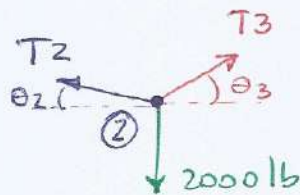
$$\theta_2 = \arctg\left(\frac{3,8 \text{ pies}}{11 \text{ pies}}\right)$$

$$\theta_2 = 19,06^\circ$$

- Analizando equilibrio de cada nudo

Nudo ②  $-T_2 \cdot \cos \theta_2 + T_3 \cdot \cos \theta_3 = 0 \rightarrow \sum F_x = 0$

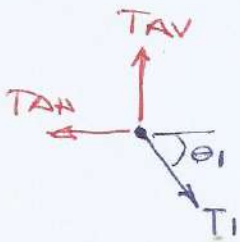
$$T_2 = \frac{2334 \text{ lb} \cdot \cos 35^\circ}{\cos 19,06^\circ}$$



$$T_2 = 2023 \text{ lb}$$

NUDO ①

$$\sum F_x = 0 \quad -T_{AH} + T_1 \cdot \cos \theta_1 = 0$$



$$T_1 = \frac{1912 \text{ lb}}{\cos 49,8^\circ}$$

$$T_1 = 2962 \text{ lb}$$

- Longitud del cable

$$S = S_1 + S_2 + S_3$$

$$S = \frac{L_1}{\cos \theta_1} + \frac{L_2}{\cos \theta_2} + \frac{L_3}{\cos \theta_3} = \frac{6 \text{ pies}}{\cos 49,8^\circ} + \frac{11 \text{ pies}}{\cos 19,06^\circ} + \frac{7 \text{ pies}}{\cos 35^\circ}$$

$$S = 9,30 \text{ pies} + 11,64 \text{ pies} + 8,55 \text{ pies}$$

$$S = 29,49 \text{ pies}$$