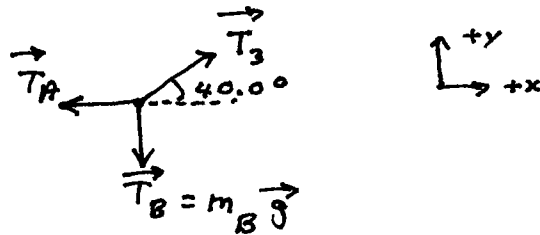


Problem 8-35

(a) FBD for junction of 3 strings:



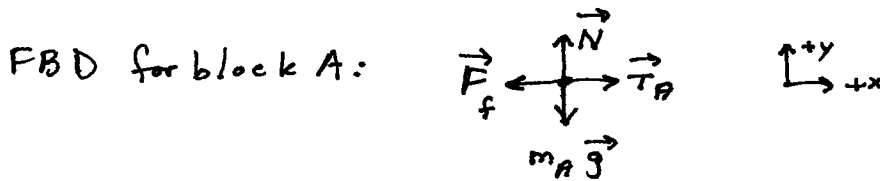
Equilibrium $\Rightarrow \Sigma F_y = m a_y = 0$

$$\therefore T_3 \sin 40.0^\circ - m_B g = 0 \quad [1]$$

$$m_B g = 20.0 \text{ N} \Rightarrow T_3 = 31.1 \text{ N}$$

Then, $\Sigma F_x = m a_x = 0 \Rightarrow T_3 \cos 40.0^\circ - T_A = 0 \quad [2]$

$$\therefore T_A = 23.8 \text{ N}$$



$$\Sigma F_x = m a_x = 0 \Rightarrow T_A - F_f = 0 \quad [3]$$

$$\therefore F_f = T_A = 23.8 \text{ N}$$

(b) From FBD for block A, and $\Sigma F_y = m a_y = 0 \Rightarrow N = m_A g = 95.0 \text{ N}$

Max. static friction: $F_{\max} = \mu_s N = 0.32(95.0) = 30.4 \text{ N}$

Similar to Eq. [3]: $T_A - F_{\max} = 0 \therefore T_A = 30.4 \text{ N}$

Eq. [2] is still valid: $T_3 \cos 40.0^\circ - T_A = 0$

$$\Rightarrow T_3 = 39.7 \text{ N}$$

Eq. [1] is still valid: $T_3 \sin 40.0^\circ - m_B g = 0$

$$\Rightarrow m_B g = 26 \text{ N}$$

2 sig. digits
(μ_s has 2 sig. digits)