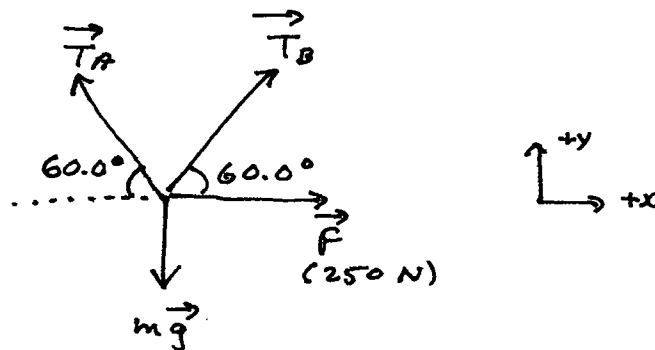


Assume that the man remains stationary.

(a) FBD for man:



$$\Sigma F_x = m a_x = 0$$

$$\therefore -T_A \cos 60.0^\circ + T_B \cos 60.0^\circ + 250 = 0$$

$$\therefore -T_A + T_B = -500 \quad [1]$$

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

$$\therefore T_A \sin 60.0^\circ + T_B \sin 60.0^\circ - (70.0)(9.80) = 0$$

$$\therefore T_A + T_B = 792.1 \quad [2]$$

$$[1] + [2] \Rightarrow 2T_B = 292.1 \text{ N} \therefore T_B = 146 \text{ N} \quad (146.1 \text{ N})$$

$$\therefore \text{from } [2], T_A = 646 \text{ N}$$

(b) - similar to (a), except  $T_B = 0$  and applied  $F$  is unknown.

$$\Sigma F_x = 0 \Rightarrow -T_A \cos 60.0^\circ + F = 0 \quad [3]$$

$$\Sigma F_y = 0 \Rightarrow T_A \sin 60.0^\circ - (70.0)(9.80) = 0 \quad [4]$$

$$\text{From } [4], T_A = 792.1 \text{ N}$$

$$\text{Subst. in } [3] \Rightarrow F = 396 \text{ N}$$