

46. We denote the tension in the upper left string (bc) as T' and the tension in the lower right string (ab) as T . The supported weight is $Mg = 19.6$ N. The force equilibrium conditions lead to

$$\begin{aligned} T' \cos 60^\circ &= T \cos 20^\circ && \text{horizontal forces} \\ T' \sin 60^\circ &= W + T \sin 20^\circ && \text{vertical forces} . \end{aligned}$$

- (a) We solve the above simultaneous equations and find

$$T = \frac{W}{\tan 60^\circ \cos 20^\circ - \sin 20^\circ} = 15 \text{ N} .$$

- (b) Also, we obtain $T' = T \cos 20^\circ / \cos 60^\circ = 29$ N.