

54. Adopting the usual convention that torques that would produce counterclockwise rotation are positive, we have (with axis at the hinge)

$$\sum \tau_z = 0 \implies TL \sin 60^\circ - Mg \left(\frac{L}{2} \right) = 0$$

where $L = 5.0$ m and $M = 53$ kg. Thus, $T = 300$ N. Now (with F_p for the force of the hinge)

$$\begin{aligned} \sum F_x = 0 &\implies F_{px} = -T \cos \theta = -150 \text{ N} \\ \sum F_y = 0 &\implies F_{py} = Mg - T \sin \theta = 260 \text{ N} \end{aligned}$$

where $\theta = 60^\circ$. Therefore (in newtons),

$$\vec{F}_p = -150 \hat{i} + 260 \hat{j} .$$