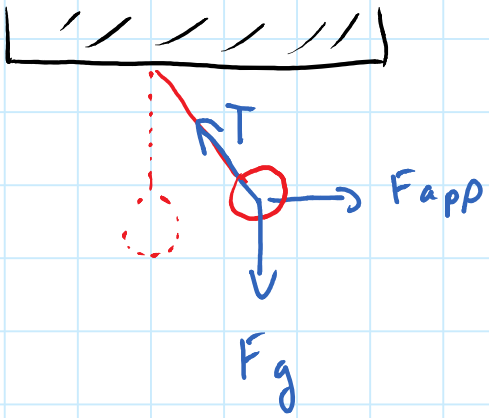
Translational Equilibrium I

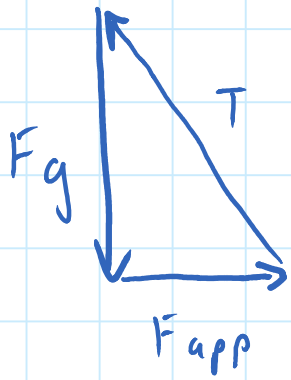
Tuesday, March 7, 2017 10:31 AM

All forces acting on an object are balanced

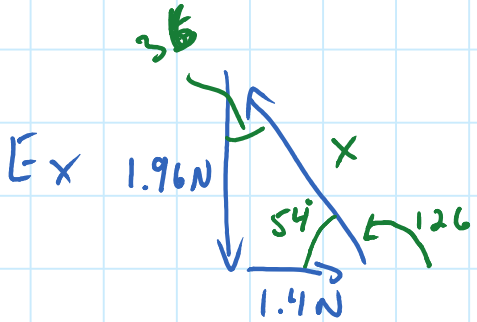
$$\left.\begin{aligned}\sum F_x &= 0\\ \sum F_y &= 0\end{aligned}\right\} F_{net} = 0$$

Static Equilibrium - when an object is completely at rest





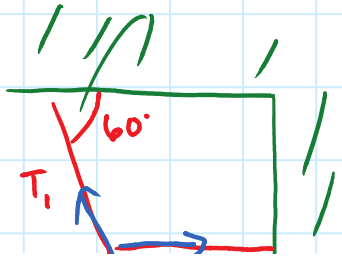
Ex

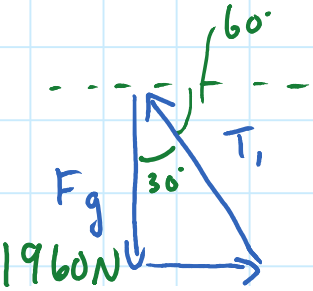


$X^2 = 1.4^2 + 1.96^2$

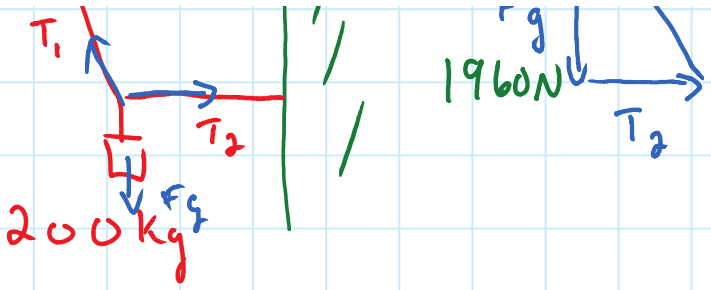
$X = 2.4\,N$

Ex





$\cos 30° = \frac{F_g}{T_1}$

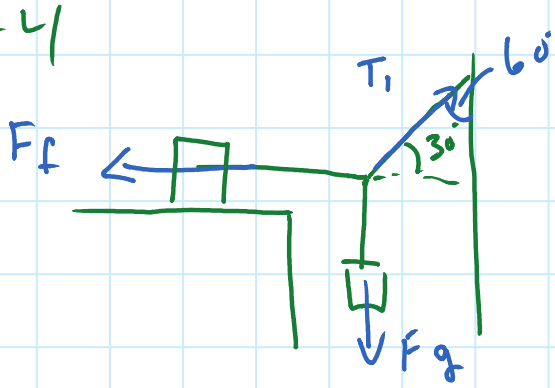


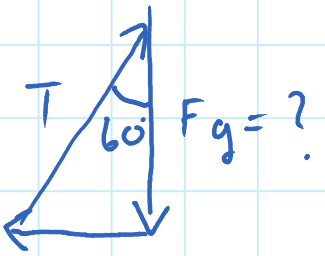
$$T_1 = \frac{F_g}{\cos 30^\circ} = \frac{1960}{\cos 30}$$

$$= 2260\,N$$

$$T_2 = 1130\,N$$

Ex #4





$$F_f = \mu F_N$$

$$= .27(15)(9.8)$$

$$= 39.7\,N$$

$$\tan 60^\circ = \frac{39.7}{F_g}, \quad F_g = \frac{39.7}{\tan 60^\circ} = 22.9\,N \div 9.8 = 2.34\,kg$$