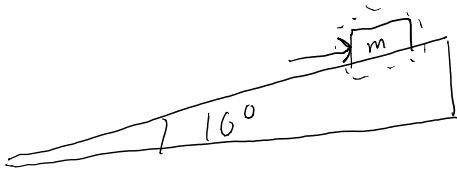
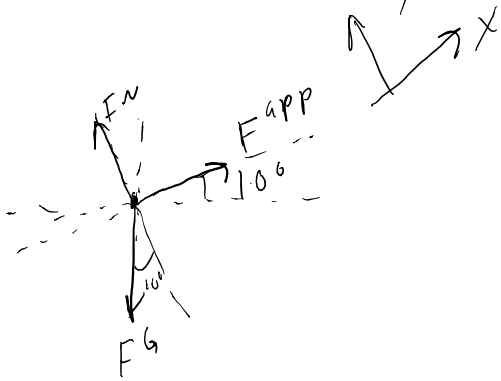


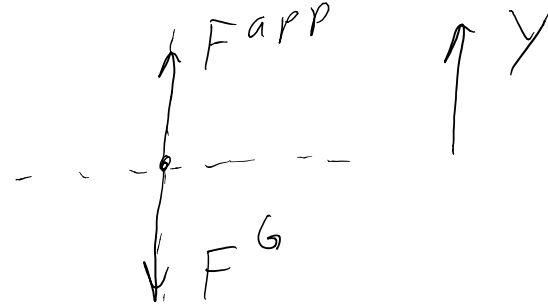
You are holding a box of mass  $m$  at the top of a 10 degree, frictionless ramp. What is the mechanical advantage of this?



The force needed to hold the block with the help of the system



The force to hold the block without aid



$$\begin{aligned} \sum F_x &= m a_x \\ F_{app} - F_x^G &= m a_x^0 \\ F_{app} - F^G \sin \theta &= 0 \\ F_{app} &= m g \sin \theta \\ F_{app} &= m g \cdot 0.17365 \end{aligned}$$

$$\begin{aligned} \sum F_x &= m a_x \\ F_{app} - F^G &= m a_x^0 \\ F_{app} - m g &= 0 \\ F_{app} &= m g \end{aligned}$$

$$M A = \frac{F_{w/out}^{app}}{F_{w/ith}^{app}} = \frac{m g}{m g \cdot 0.17365} = 5.76$$