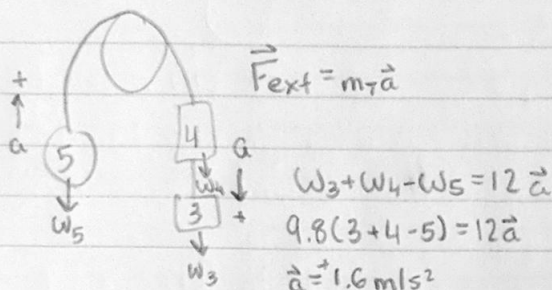


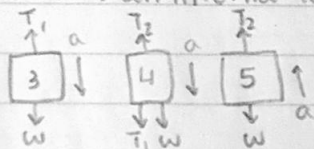
## System vs Single Object

PH III

$$\vec{F}_{\text{ext}} = m_T \vec{a} \quad \vec{F}_{\text{net}} = m \vec{a}$$



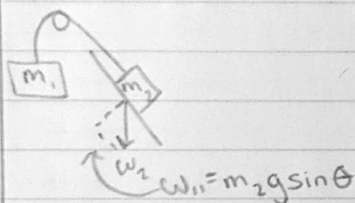
Tension is an internal force



$$3(1.6) = 3(9.8) - T_1 \quad 5(1.6) = T_2 - 5(9.8)$$

$$T_1 = 24.6 \text{ N}$$

$$T_2 = 57 \text{ N}$$



Equilibrium (mechanical)

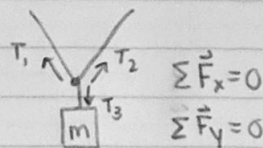
$$1. \sum \vec{F} = 0, \vec{a} = 0 \rightarrow \sum \vec{F}_x = \sum \vec{F}_y = \sum \vec{F}_z = 0$$

not necessarily at rest

$$2. \sum \vec{\tau} = 0, \vec{\alpha} = 0$$

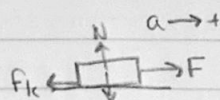
$\tau$  torque

not necessarily at rest



Friction

$$\text{Kinetic: } f_k = \mu_k N$$



always opposes the motion

$$\text{Static: } f_s \leq \mu_s N$$

