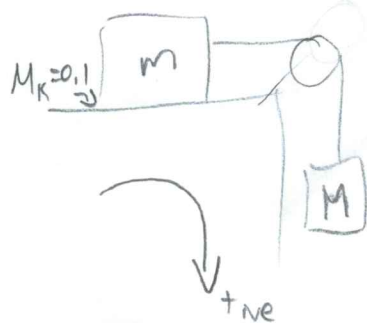# Atwoods

- If objects touching and have same $\vec{a}$, you can combine them as one system
- When you analyze FBD of a system, you ignore internal forces.
  - why? because they cancel each other out when you add their ma equation
    revisit grade 11 textbook (The first pulley system question)

Find $\vec{a}$ for the following.
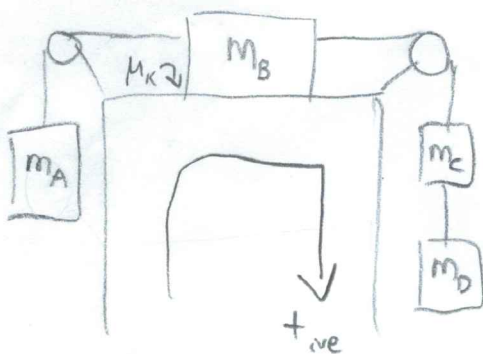

$$(m+M)a = Mg - \mu_K \, mg$$

$$a = \frac{Mg - \mu_K mg}{m+M}$$
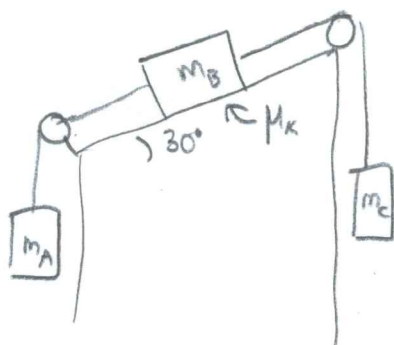
$$Ma = Mg - T$$

$$T = Mg - Ma$$

Find $\vec{a}$

$$(m_A + m_B + m_C + m_D)a = m_C g + m_D g - m_A g - \mu_K m_B g$$

$$a = \frac{g(m_C + m_D - m_A - \mu_K m_B)}{m_A + m_B + m_C + m_D}$$

PRACTICE

Find $\vec{a}$ and all tensions.