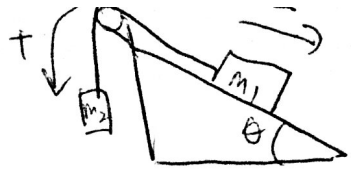

designate up the incline as positive + down the incline as negative for $|a_{sys}|$

(61) a) $|a_{sys}| = \frac{\Sigma F_{ext}}{m_{tot}} = \frac{m_2 g - m_1 \sin\theta g}{m_1 + m_2}$

external forces: gravity on m_2, parallel component of gravity on m_1

b) the system accelerates in the positive direction when $m_2 > m_1 \sin\theta$ ($\Sigma F_{ext} > 0$)
it accelerates in the negative direction when $m_2 < m_1 \sin\theta$

(62) $|a_{sys}| = \frac{\Sigma F_{ext}}{m_{tot}}$ friction is also an external force that point in the negative direction b/c it is opposing the upward motion of m_1 on the incline

$$|a_{sys}| = \frac{m_2 g - m_1 g \sin\theta - \mu_K m g \cos\theta}{m_1 + m_2}$$

$$|a_{sys}| = \frac{(2.7\,kg)(9.81\,m/s^2) - (2.7\,kg)(9.81\,m/s^2)(\sin 25) - (0.15)(2.7\,kg)(9.81\,m/s^2)\cos 25}{2.7 + 2.7}$$

$= \boxed{2.2\,m/s^2}$ up the plane

(63) $a = 0$, $\Sigma F_{ext} = 0$

$$\Sigma F_{ext} = m_2 g - m_1 g \sin\theta - \mu_K m g \cos\theta = 0$$

$$m_2 g - m_1 g \sin\theta = \mu_K m g \cos\theta$$

$$\mu_K = \frac{m_2 g - m_1 g \sin\theta}{m g \cos\theta} = \boxed{0.64}$$