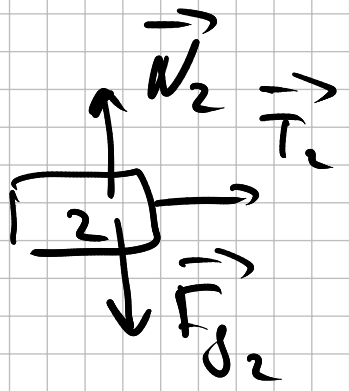
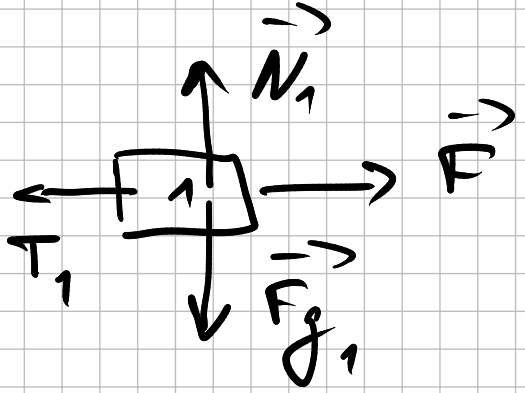
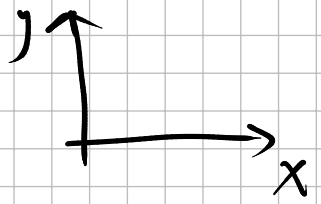






$$m_2\vec{a}_2 = \vec{N}_2 + \vec{T}_2 + \vec{F}_{g2} \qquad m_1\vec{a}_1 = \vec{T}_1 + \vec{N}_1 + \vec{F} + \vec{F}_{g1}$$

$$\vec{a}_2 = \vec{a}_1 = \vec{a} \qquad |T_2| = |T_1| = T$$

$$x: \quad m_2 a_x = T_2 \quad | \quad m_1 a_x = -T_1 + F$$

$$m_1 = m_2 = m \qquad m a_x = T \qquad m a_x = -T + F$$

$$m a_x = -m a_x + F$$

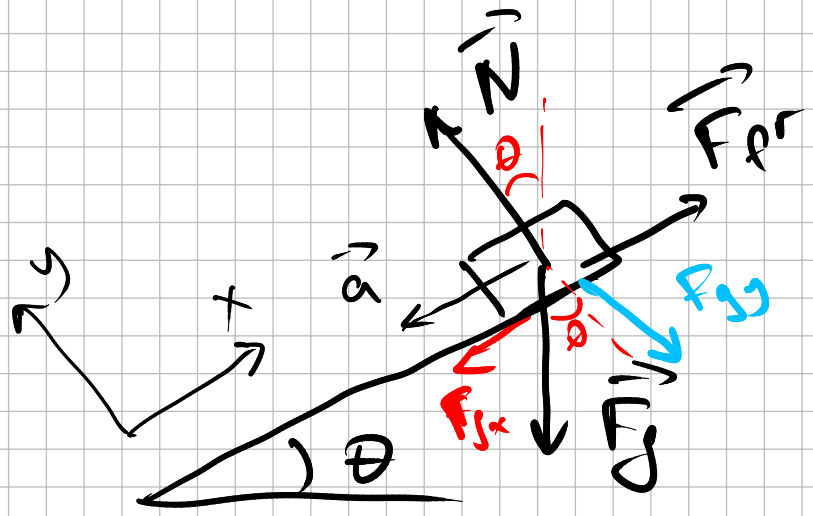
$$a_x = \frac{F}{m+m}$$

$$T = m a_x = \frac{F}{2m} \cdot m = \frac{F}{2}$$

Friction

$$F_{fr} = \mu N$$

$$0 < \mu \leq 1$$



$$m\vec{a} = \vec{N} + \vec{F}_{fr} + \vec{F}_g$$

$$x: \quad ma_x = 0 + F_{fr} - mg\sin\theta$$

$$y: \quad ma_y = 0 = N + 0 - mg\cos\theta$$

$$N = mg\cos\theta$$

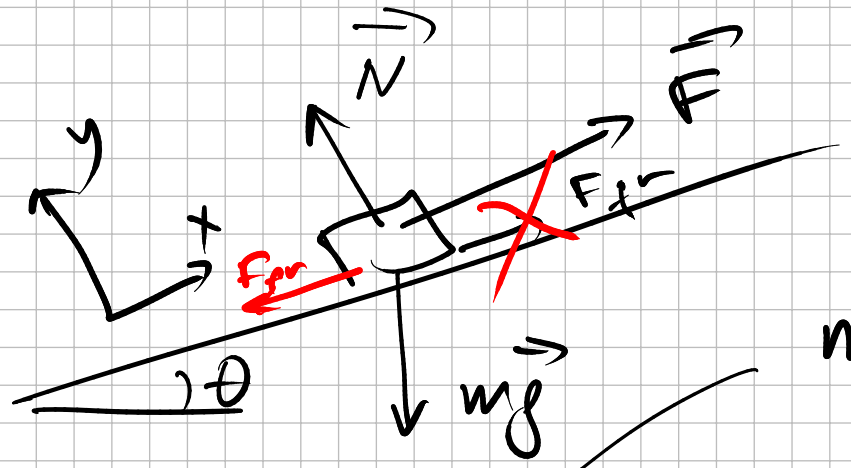
$$x: \quad ma_x = \mu N - mg\sin\theta$$

$$ma_x = \mu mg\cos\theta - mg\sin\theta$$

$$a_x = (\mu\cos\theta - \sin\theta)\, g$$

if $a_x = 0 \quad \Rightarrow \quad \mu\cos\theta_c - \sin\theta_c = 0$

$$\tan\theta = \mu$$



$$m\vec{a} = \vec{N} + \vec{F}_{fr} + m\vec{g} + \vec{F}$$

$$ma_x = -\mu mg\cos\theta - mg\sin\theta + F$$

if $\mu = 0$ friction less

$a_x = 0$
> 0

$$\therefore \quad 0 = -0 - mg\sin\theta + F$$

$$F = mg\sin\theta$$

$ma_x \simeq 0$ $\qquad 0 = -\mu mg\cos\theta - mg\sin\theta + F$

$$F = mg(\sin\theta + \mu\cos\theta)$$

if $\mu = 1 \Rightarrow F = mg(\sin\theta + \cos\theta)$