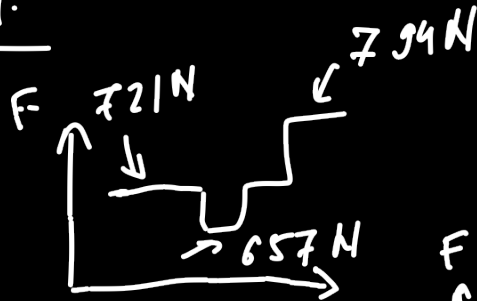


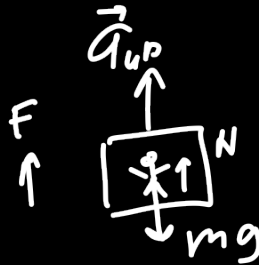
Homework 9.

N1.



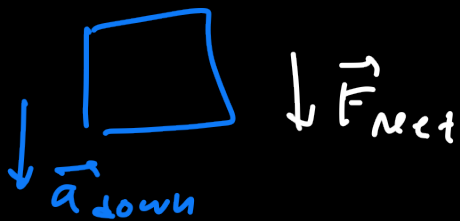
$M = 72.1 \text{ kg.}$

$F_{\text{net}} = N_{\text{up}} - mg$



$M \cdot a_{\text{up}} = F_{\text{net}} = N_{\text{up}} - mg$

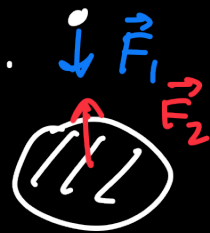
$a_{\text{up}} = \frac{N_{\text{up}}}{M} - g = 1 \frac{\text{m}}{\text{s}^2}$



$F_{\text{net}} = m \cdot g - N_{\text{down}}$

$a_{\text{down}} = g - \frac{N_{\text{down}}}{m} = 0.9 \frac{\text{m}}{\text{s}^2}$

N3.



$F_1 = W = m \cdot g = 10 \text{ N}$

$\vec{F}_2 = -\vec{F}_1 \rightarrow F_2 = 10 \text{ N}$

$F_2 = M \cdot a \Rightarrow$

$a = \frac{10 \text{ N}}{6 \cdot 10^{29} \text{ kg}}$

$\sim 10^{-10} \text{ m.}$

$\approx 1.7 \cdot 10^{-24} \frac{\text{m}}{\text{s}^2}$

Classwork

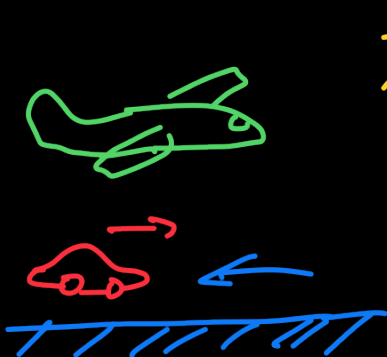
Inertial Reference frames

Elevator with acceleration:

- 1) gravity feels different! ← additional forces.
- 2) Sun plays the role!
- 3) Take into account that the elevator has acceleration! ↙
- 4) gravity doesn't change and no flaws in Newton's laws.

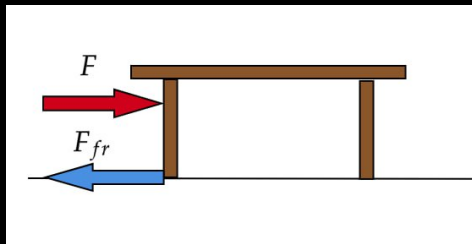
Laws are valid under certain conditions.

Newton's laws are valid in inertial reference frames.

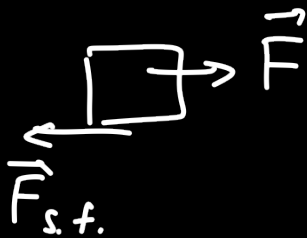


Non-inertial frames:
accelerated w.r.t. inertial frames.
→ have fictitious forces.

Friction

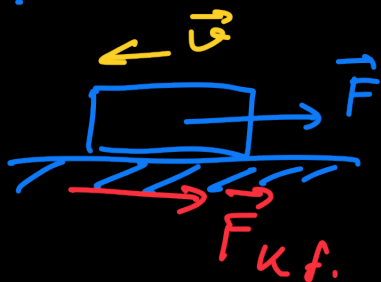
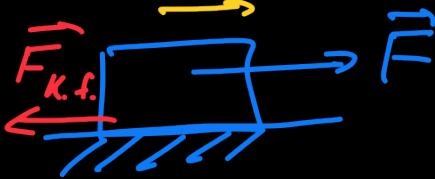


static
kinetic



$$\vec{F}_{s.f.} = -\vec{F}$$

$$F_{Net} = F - F_{s.f.} = M \cdot a = 0$$



$$F_{k.f.} = \mu \cdot N$$

$$N = m \cdot g$$

$\mu \rightarrow \text{"}\mu\text{"}$

$$0 < \mu < 1$$

