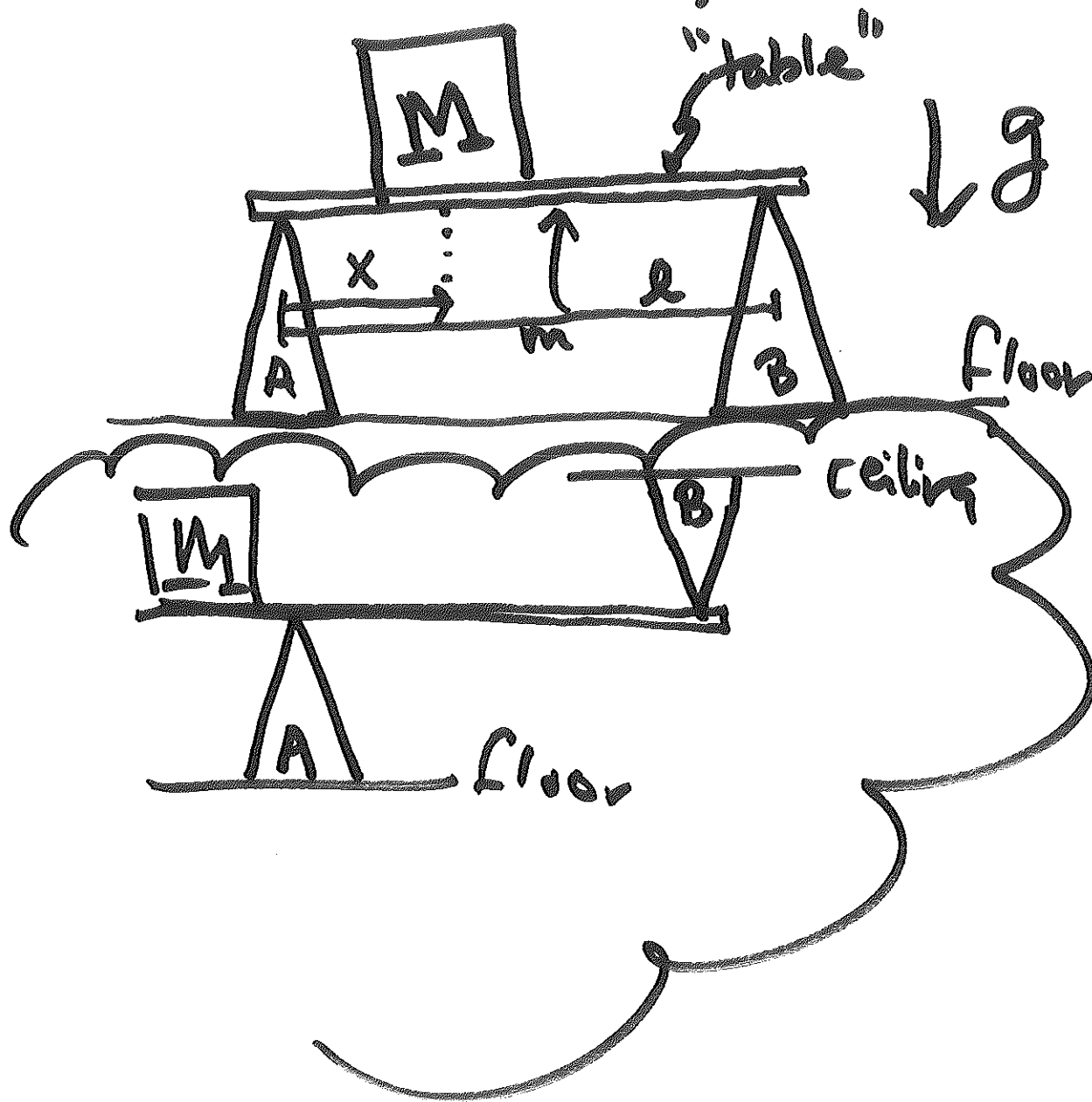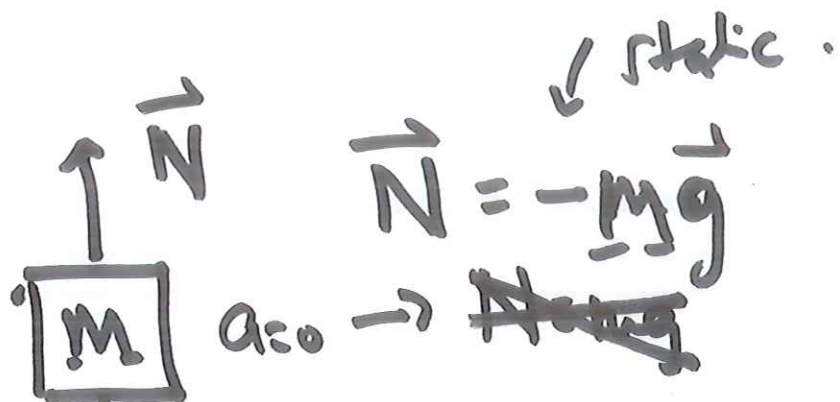# NYu Physics I   2017-10-12

Agenda: - Exams. $\longleftarrow$ [Box] units, direction, ...?

- Questions.

- Block on table.

- Reading — Forces, momenta impulse collision

Torque (cross product)

Block on a light table
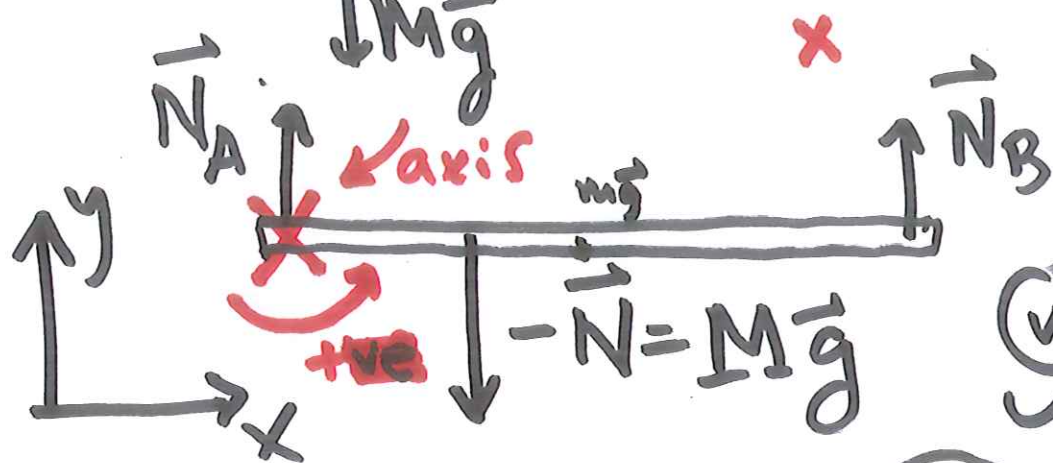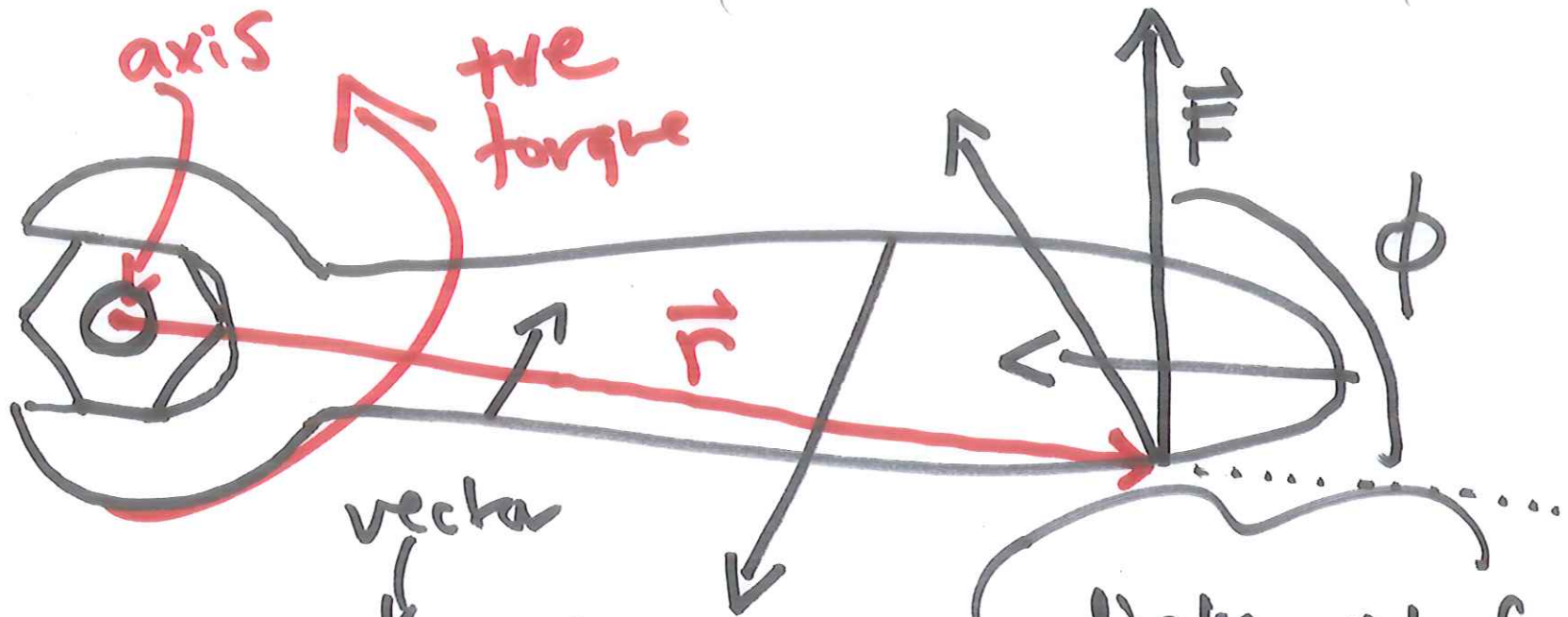

"table"

$\downarrow g$

$m \ll M$

M

x

ℓ

m

A

B

floor

M

B

ceiling

A

floor

$$\vec{N}$$

$$\vec{N} = -M\vec{g} \quad \swarrow \text{static.}$$

$\boxed{M}$ $a_{\infty} \rightarrow$ ~~$N=M\vec{a}$~~

$\downarrow M\vec{g}$

$m \ll M$

(ignore m terms)

$\vec{N}_A$

$\swarrow$ axis

$\uparrow y$

$\times$

$+ve$

$\downarrow -\vec{N} = M\vec{g}$

$m\vec{g}$

$\uparrow \vec{N}_B$

static.

$\times$

$\longrightarrow x$

positive = +ve

$\textcircled{y}: N_A + N_B + (-Mg) = 0$

$\textcircled{torque}: (-x \, Mg) + \ell \, N_B = 0$

$\uparrow$ statics

axis

+ve torque

$\vec{F}$

ϕ

$\vec{r}$

vector

direction: out of page

$$\vec{\tau} \equiv \vec{r} \times \vec{F} \longleftarrow \text{vector}$$

pseudo-vector

cross product

magnitude:

$$|\vec{\tau}| = |\vec{r}| \, |\vec{F}| \cdot \sin \phi$$

$$\ell N_B = x\,Mg$$

$$N_B = \frac{x}{\ell}\,Mg$$

$$N_A = Mg - N_B$$

$$N_A = \frac{\ell - x}{\ell}\,Mg$$