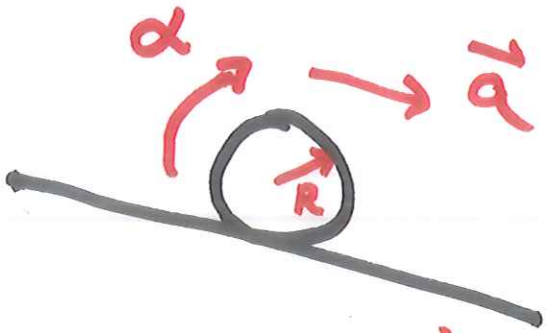
NYU Physics I — 2016-11-08

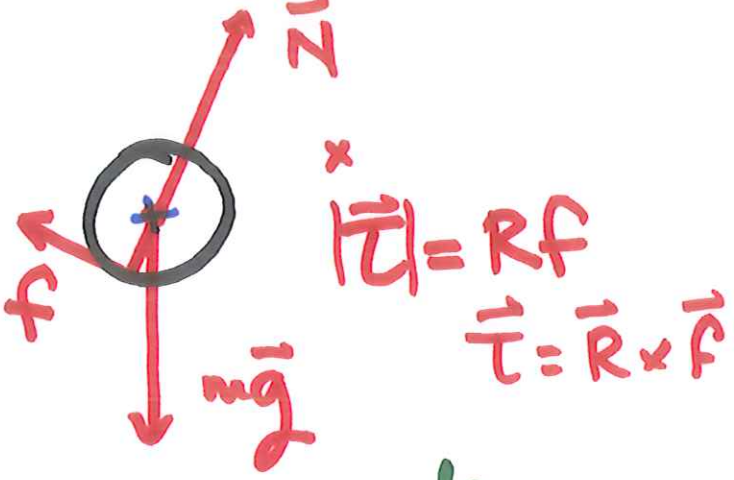
Agenda — Reading — Angular momentum.
- Moment of inertia
- Rolling w/o slipping

— Understand your mistakes

— Qs

— rolling down the plane.





$|\vec{\tau}| = Rf$

$\vec{\tau} = \vec{R} \times \vec{f}$

torque

$\vec{\tau} = I\vec{\alpha}$ ← angular accel.

$\vec{F} = m\vec{a}$

$KE_{rot} = \frac{1}{2} I \omega^2$

$KE = \frac{1}{2} m v^2$

moment of inertia

angular velocity

"Rolling without slipping"

kinematic statement

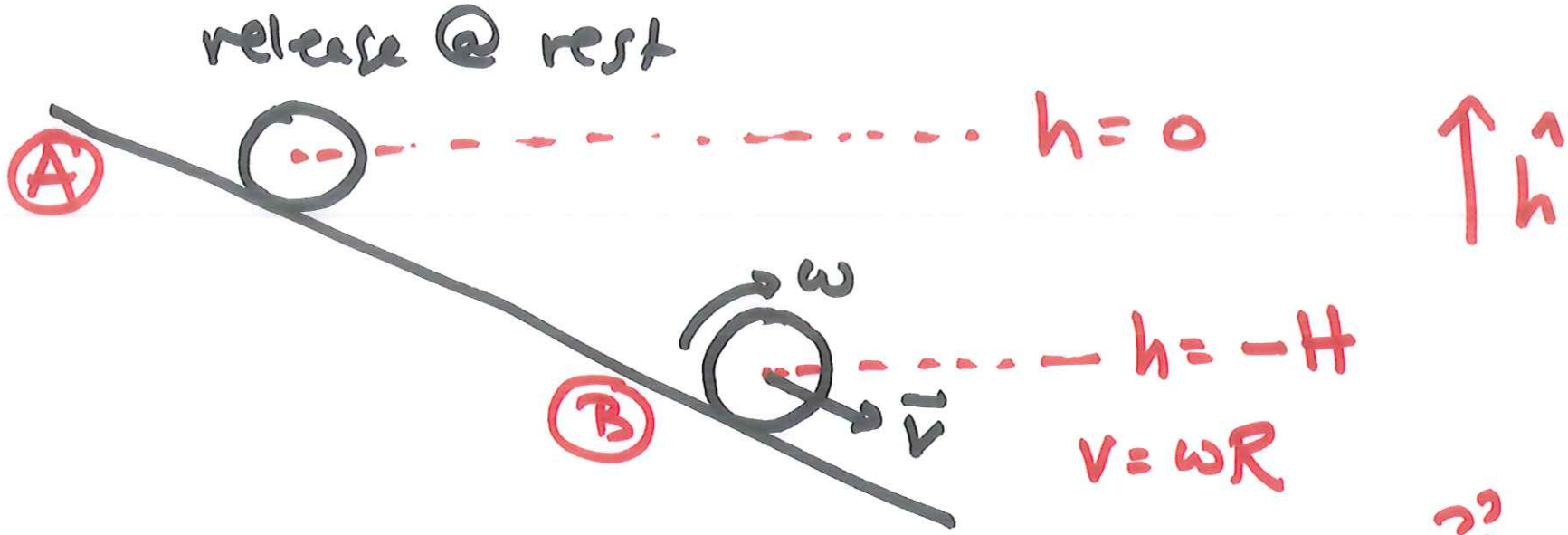
$\frac{\Delta\theta}{\Delta t} = \frac{2\pi}{T}$ $\quad \frac{\Delta x}{\Delta t} = \frac{2\pi R}{T}$

ω

$v = \omega R$

$a = \alpha R$

R.w/o.S.



Ⓐ $PE = 0$ $KE_{lin} = 0$ $KE_{rot} = 0$

Ⓑ $PE = -mgH$ $KE_{lin} = \frac{1}{2}mv^2$ $KE_{rot} = \frac{1}{2}I\omega^2$??

units of I: $kg\,m^2$ $I = \text{☹}MR^2$