KINEMATICS

translational		rotational
position $\vec{x}$		$\vec{\theta}$
velocity $\vec{v}$	$\vec{\omega}\times\vec{r}$	$\vec{\omega}$
acceleration $\vec{a}$	$\vec{\alpha}\times\vec{r}$	$\vec{\alpha}$

DYNAMICS

translational		rotational
- force $\vec{F}$	$\vec{r}\times\vec{F}$	torque $\vec{\tau}$
- momentum $\vec{p}$	$\vec{r}\times\vec{p}$	angular momentum $\vec{L}=I\vec{\omega}$

$\vec{p}=m\vec{v}$ (m: mass)

I: moment of inertia

LAWS OF MOTION

translational	rotational
Equilibrium: $\vec{F}=\vec{0}$	$\vec{\tau}=\vec{0}$
constant m: $\vec{a}=0$	constant I: $\alpha=0$
general case: $\vec{p}=$ constant	general case: $\vec{L}=$ constant
2nd law: $\vec{F}=\frac{d\vec{p}}{dt}$	$\tau=\frac{dL}{dt}$
if m is constant: $\vec{F}=m\vec{a}$	if I is constant: $\tau=I\alpha$

mr^2 $\vec{\omega}\uparrow$

no torque → no change in angular momentum

(gravity, centripetal force cannot change angular momentum)