1 Rolling, Torque, Angular Momentum

1.1 Rolling

Quantities

Quantity	Formula
Rolling velocity	$v_{com} = \omega$
Rolling kinetic energy	$K = \frac{1}{2} I_{com} \omega^2 + \frac{1}{2} M v_{com}^2$
Linear acceleration of rolling body	$a_{com,x} = -\dfrac{g \sin\theta}{1 + I_{com}/MR^2}$

Torque and Angular Momentum

Quantity	Formula
Torque	$\vec{\tau} = \vec{r} \times \vec{F}$
Torque (magnitude)	$\tau = rF \sin\theta$
Angular Momentum	$L = \vec{r} \times \vec{p} \iff m(\vec{r} \times \vec{v})$
Angular Momentum (magnitude)	$L = rmv \sin\theta$
Second law (angular)	$\vec{\tau_{net}} = \dfrac{d\vec{L}}{dt}$