Translational to Angular Conversions

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1 Lookup

x	θ	
v	ω	
a	α	
m	I	Moment of inertia
F	τ	Torque
p	L	Angular momentum

2 Basic Conversions

$$I = \sum mr^2 \tag{1}$$

$$s = r\theta \tag{2}$$
$$v = r\omega = r\dot{\theta} \tag{3}$$
$$a = r\alpha = r\dot{v} = r\ddot{\theta} \tag{4}$$

$$L = I\omega = rp \tag{5}$$
$$\tau = I\alpha = rF \tag{6}$$

2.1 Understanding Angular Momentum

Starting with Equation 5 and using Equation 1 and Equation 3:

$$\begin{aligned} L &= I\omega \\ &= \frac{v}{r}\sum mr^2 \\ &= vmr, && \text{assuming a single point object} \\ &= rp \end{aligned}$$

3 Vectors

$$\vec{L} = \vec{r} \times \vec{p} \tag{7}$$