

CHAPTER 9: Rotational Dynamics

Torque of a force (magnitude) : $\tau = F\ell$

Equilibrium : $\sum F_x = 0$ ($a_x = 0$)

$\sum F_y = 0$ ($a_x = 0$)

$\sum \tau = 0$ ($\alpha = 0$)

Center of Gravity : $x_{cg} = \frac{W_1x_1 + W_2x_2 + \dots}{W_1 + W_2 + \dots}$

Moment of Inertia : $I = \sum mr^2$

$\sum \tau = \tau_{net} = I\alpha$ (α in rad/s)

Rotational Work : $W_R = \tau\theta$

Rotational Kinetic Energy : $E_R = \frac{1}{2}I\omega^2$

Angular Momentum : $L = I\omega$