From Chapter 9 – Chapter 11

$\vec{p} = m\vec{v}$; $\vec{I} = \int_{t_i}^{t_f} \vec{F}\, dt$; $x_{CM} \equiv \dfrac{m_1 x_1 + m_2 x_2}{m_1 + m_2}$; $\vec{r}_{CM} = \dfrac{1}{M}\int \vec{r}\, dm$;

$s = r\theta$; $\theta = \dfrac{s}{r}$; $\omega = \dfrac{d\theta}{dt}$;

For constant

$\omega_f = \omega_i + \alpha t$; $\theta_f = \theta_i + \omega_i t + \frac{1}{2}\alpha t^2$; $\omega_f^2 = \omega_i^2 + 2\alpha(\theta_f - \theta_i)$; $\theta_f = \theta_i + \frac{1}{2}(\omega_i + \omega_f)t$;

$v = r\,\omega$; $a_t = r\omega$; $a_c = \dfrac{v^2}{r} = r\omega^2$; $I \equiv \sum_i m_i r_i^2$;

$K_R = \frac{1}{2} I\omega^2$; $I = \int r^2 dm$; $I = \int \rho r^2\, dV$;

$I_z = MR^2$ (Thin Hoop); $I_y = \dfrac{1}{12} ML^2$ (Rigid Rod); $I_z = \dfrac{1}{2} MR^2$ (Solid Cylinder)

$I_z = \dfrac{2}{5} MR^2$ (Solid Sphere); $I_z = \dfrac{2}{3} MR^2$ (Thin Spherical Shell);

$I = I_{CM} + MD^2$ (Parallel Axis Theorem); $\sum \tau = I\,\alpha$;

$v_{CM} = R\omega$; $a_{CM} = R\alpha$; $K = \frac{1}{2} I_P \omega^2$ (Rotational Kinetic Energy);

$\vec{\tau} = \vec{r} \times \vec{F}$ (Torque); $\vec{L} \equiv \vec{r} \times \vec{p}$ (Angular Momentum); $\sum \vec{\tau} = \dfrac{d\vec{L}}{dt}$;

$L_z = I\omega$; $\sum \tau_{ext} = I\,\alpha$;