Rotational kinematics (constant angular acceleration)

$$\mathbf{v}_f = \mathbf{v}_i + \mathbf{a}t \qquad \omega_f = \omega_i + \alpha t$$

$$x_f = x_i + v_i t + \tfrac{1}{2} a t^2 \qquad \theta_f = \theta_i + \omega_i t + \tfrac{1}{2}\alpha t^2$$

$$\mathbf{v}_f^2 = \mathbf{v}_i^2 + 2a(\mathbf{x}_f - \mathbf{x}_i) \qquad \omega_f^2 = \omega_i^2 + 2\alpha(\theta_f - \theta_i)$$

$$\mathbf{x}_f = \mathbf{x}_i + \tfrac{1}{2}(\mathbf{v}_i + \mathbf{v}_f)t \qquad \theta_f = \theta_i + \tfrac{1}{2}(\omega_i + \omega_f)t$$

Motion in a circle

$$s = r\theta \qquad v = r\omega \qquad a_r = \frac{v^2}{r} = r\omega^2 \qquad a_t = r\alpha$$

Relationship between motion/dynamics in a straight line and angular motion/dynamics

$$v = \frac{dx}{dt} \qquad \omega = \frac{d\theta}{dt}$$

$$a = \frac{dv}{dt} \qquad \alpha = \frac{d\omega}{dt}$$

$$F = ma \qquad \tau = I\alpha$$

$$W = \int F\,dx \qquad W = \int \tau\,d\theta$$

$$P = mv \qquad L = I\omega$$

$$K = \tfrac{1}{2}mv^2 \qquad K = \tfrac{1}{2}I\omega^2$$

$$P = Fv \qquad P = \tau\omega$$