Part E: Kinematic Equations for Rotational Motion

The four kinematic equations from before still apply in rotational motion
Each quantity has been replaced by an analogous quantity:

Linear kinematic quantity	**Analogous Rotational Kinematic Quantity**
Position (x)	Angular position θ
Displacement Δx	Angular displacement $\Delta \theta$
Velocity v	Angular velocity ω
Acceleration a	Angular acceleration α
Time Δt	Time Δt

Name	**Linear Kinematic Equation**	**Rotational Kinematic Equations**
Definition of Acceleration	$v_f = v_i + a \bullet \Delta t$	$\omega_f = \omega_i + \alpha \bullet \Delta t$
The King of Kinematic Equations	$\Delta x = v_i \bullet \Delta t + \frac{1}{2} a (\Delta t)^2$	$\Delta \theta = \omega_i \bullet \Delta t + \frac{1}{2} \alpha (\Delta t)^2$
The Average Velocity Formula	$\Delta x = \left(\frac{v_i + v_f}{2} \right) \Delta t$	$\Delta \theta = \left(\frac{\omega_i + \omega_f}{2} \right) \Delta t$
No-Time Equation	$v_f^2 = v_i^2 + 2a \bullet \Delta x$	$\omega_f^2 = \omega_i^2 + 2\alpha \bullet \Delta \theta$