$$A_p = \ddot{p}e^{j\theta} + 2j\omega\dot{p}e^{j\theta} + p\alpha j e^{j\theta} - p\omega^2 e^{j\theta}$$

$$W = mg \quad F = \mu_s W = \mu_s mg \quad A = \frac{\mu_s mg}{m} = \mu_s g$$

$$\vec{A} = \underbrace{p\alpha j e^{j\theta}}_{t} \underbrace{- p\omega^2 e^{j\theta}}_{r} = p\alpha\hat{t} + p\omega^2\hat{r}$$

p = radius (m)

ω = ang. vel. (rad/s)

α = ang. acl. (rad/s^2)

$$|\vec{A}| = \sqrt{(\alpha p)^2 + (p\omega^2)^2}$$

$$\mu_s g \geq \sqrt{(\alpha p)^2 + (p\omega^2)^2}$$

$$A^2 = \alpha^2 p^2 + p^2\omega^4$$

$$\alpha^2 p^2 = A^2 - p^2\omega^4$$

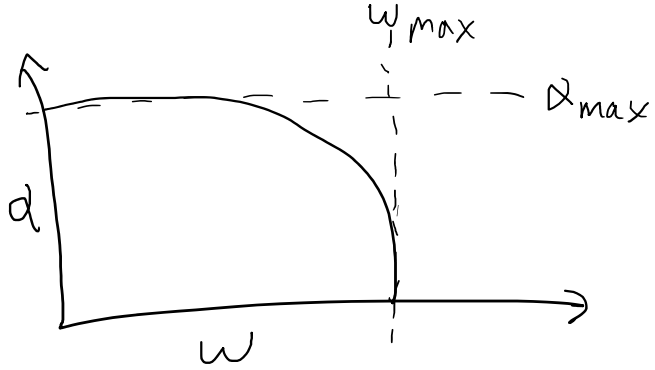
$$\alpha^2 = \frac{A^2}{p^2} - \omega^4$$

$$\alpha = \sqrt{\frac{A^2}{p^2} - \omega^4}$$

$$0 = \sqrt{\frac{A^2}{p^2} - \omega^4}$$

$$\frac{A^2}{p^2} = \omega^4$$

$$\omega_{max} = \sqrt[4]{\frac{A^2}{p^2}} = \sqrt[4]{\alpha_{max}^2} = \sqrt{\alpha_{max}}$$



$$\alpha_{max} = \sqrt{\frac{A^2}{p^2} - 0^4} = \frac{A}{p}$$