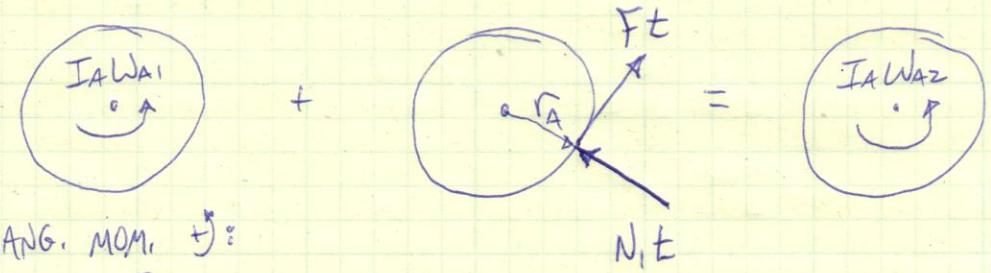
AFTER SLIPPING PERIOD IS OVER, ω_B = CONSTANT AND ω_A = CONSTANT.

PRINCIPLE OF IMPULSE AND MOMENTUM:

DISK A:



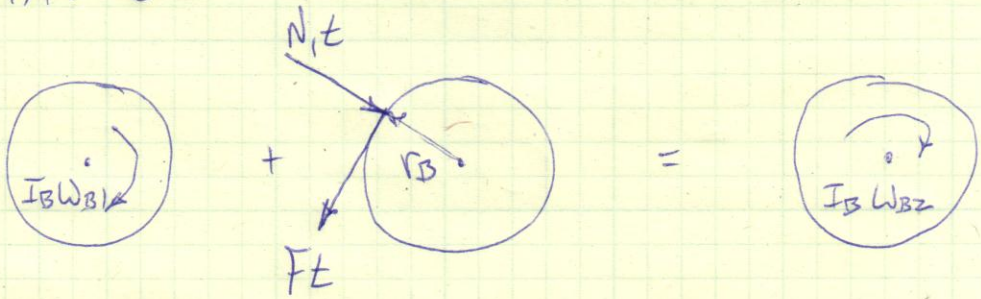
ANG. MOM. $+\circlearrowleft$:

$$I_A\omega_{A1}^{\,0} + Ft \cdot r_A = I_A\omega_{A2}$$

$$I_A = \frac{1}{2} m_A r_A^2$$

$$\boxed{Ft = \frac{1}{2} m_A r_A \omega_{A2}} \quad (1)$$

DISK B:



ANG. MOM. $+\circlearrowleft$:

$$-I_B\omega_{B1} + Ft \cdot r_B = -I_B\omega_{B2}$$

$$Ft = \frac{I_B}{r_B} \cdot (\omega_{B1} - \omega_{B2})$$

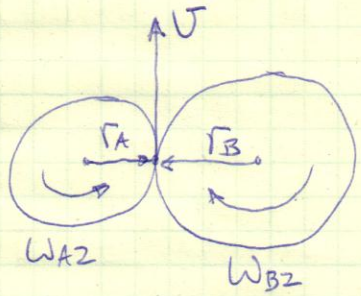
$$I_B = \frac{1}{2} m_B r_B^2$$

$$\boxed{Ft = \frac{1}{2} m_B r_B (\omega_{B1} - \omega_{B2})} \quad (2)$$

SET (1) = (2):

$$\frac{1}{2} m_A r_A \omega_{A2} = \frac{1}{2} m_B r_B (\omega_{B1} - \omega_{B2})$$

KINEMATICS: FOR NO SLIPPING,



$$v = r_B \omega_{B2}$$

$$v = r_A \omega_{A2}$$

$$r_A \omega_{A2} = r_B \omega_{B2}$$

$$\omega_{A2} = \left(\frac{r_B}{r_A}\right) \omega_{B2}$$

$$m_A r_A \left[\left(\frac{r_B}{r_A}\right) \omega_{B2}\right] = m_B r_B (\omega_{B1} - \omega_{B2})$$

$$m_A \omega_{B2} = m_B \omega_{B1} - m_B \omega_{B2}$$

$$(m_A + m_B) \omega_{B2} = m_B \omega_{B1}$$

$$\boxed{\omega_{B2} = \left(\frac{m_B}{m_A + m_B}\right) \cdot \omega_{B1}}$$