



$$\Sigma \tau = \frac{d}{dt}(I\omega) \Rightarrow T'' R - T' R = \frac{d}{dt}(I\omega)$$

$$T' = M_A a \quad M_B g - T'' = M_B a$$

$$(M_B g - M_B a)R - M_A a R = \frac{d}{dt}\left(I \frac{v}{R}\right)$$

$$M_B g R = M_B a R + M_A a R + \frac{d}{dt}\left(\frac{I}{R} v\right)$$

$$M_B g R = \frac{d}{dt}\left[\left(M_B R + M_A R + \frac{I}{R}\right)v\right]$$

$$a = \frac{M_B g}{M_B + M_A + \frac{I}{R^2}}$$