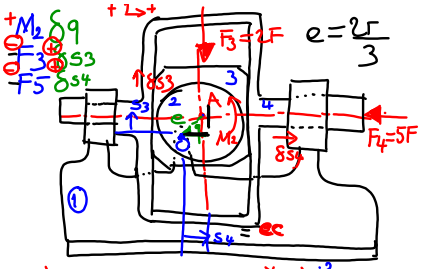
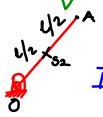


a) $I^*(q)\ddot{q} + \frac{1}{2}\frac{dI^*(q)}{dq}\dot{q}^2 = Q(q)$

$\Sigma Ek = \frac{1}{2} I^*(q)\dot{q}^2$

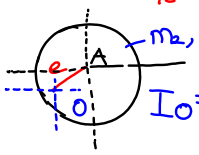
$Ek_2 + Ek_3 + Ek_4 = \frac{1}{2} I^*(q)\dot{q}^2$

$\frac{1}{2} I_{O_2\,disk}\dot{q}^2 + \left(\frac{1}{2} m_3 V_x^2 + \frac{1}{2} m_3 V_4^2\right) + \frac{1}{2} m_4 V_x^2$



$I_O = I_S + m\left(\frac{l}{2}\right)^2$

$\frac{1}{12} ml^2$



$I_O = I_{disk} + m_2 e^2$

$= \frac{1}{2} m_2 r^2 + m_2 \left(\frac{2r}{3}\right)^2$

$= \frac{1}{2} \cdot 2m r^2 + 2m \frac{4r^2}{9}$

$mr^2 + \frac{8}{9} mr^2$

$\frac{17 mr^2}{9}$

$I_{O_2\,disk} = \frac{17}{9} mr^2$

$s_4 = e\cos q$

$s_3 = e\sin q$

$V_x = s_4 = -e\sin q\,\dot{q}$

$V_y = s_3 = e\cos q\,\dot{q}$

$\delta s_4 = -e\sin q\,\delta q$

$\delta s_3 = e\cos q\,\delta q$

$\frac{1}{2}\left(\frac{17}{9} mr^2\right)\dot{q}^2 + \frac{1}{2} m_3 \left(-e\sin q\,\dot{q}\right)^2 + \frac{1}{2} m_3 \left(e\cos q\,\dot{q}\right)^2 + \frac{1}{2} m_4 \left(-e\sin q\,\dot{q}\right)^2 = \frac{1}{2} I^*(q)\dot{q}^2$

$I^*(q) = \frac{11}{3} + \frac{32}{9} mr^2 \sin^2 q$

$M\delta q - F_3 \cdot \delta s_3 - F_4 \delta s_4$

$M\delta q - F_3 \cdot (e\cos q\,\delta q) - F_4 (e\sin q\,\delta q)$

$\delta q\left(M - F_3 e\cos q + F_4 \sin q\right) = \delta W$

$Q(q)$

genellestirilmis kuvvet

M.H. Denk. = ...

$I^*(q)\ddot{q} + \frac{1}{2}\frac{dI^*(q)}{dq}\dot{q}^2 = Q(q)$

$\left(\frac{11}{3} mr^2 + \frac{32}{9} mr^2 \sin^2 q\right)\ddot{q} + \frac{32}{9} mr^2 \sin q \cos q \cdot \dot{q}^2$

$\frac{1}{2} \cdot \frac{32}{9} \cdot 2 \cdot mr^2 \sin q \cos q = -Fr\left(\frac{4}{3}\cos q - \frac{10}{3}\sin q\right) - M_2$

b) $\dot{q} = \omega \Rightarrow$ sbt

açısal hız

$\ddot{q}$ → açısal ivme

"sıfır"

$\ddot{q} = 0 \rightarrow M_2 = ...$

c) $M_2 \equiv 0$

Denge → $Q(q) = 0$

$\frac{4}{3} Fr\cos q = \frac{10}{3} Fr\sin q$

$q = \tan^{-1}\frac{4}{10}$