$\tau = I \cdot \alpha$

In this rotational equation, τ is the net external torque on the system, α is the angular acceleration of the system, and I is the Rotational Inertia of the system:

$$I = \sum_{n} \left[m_i \cdot (r_i)^2 \right]$$

m_i is contribution of mass i at distance to rotation point r_i

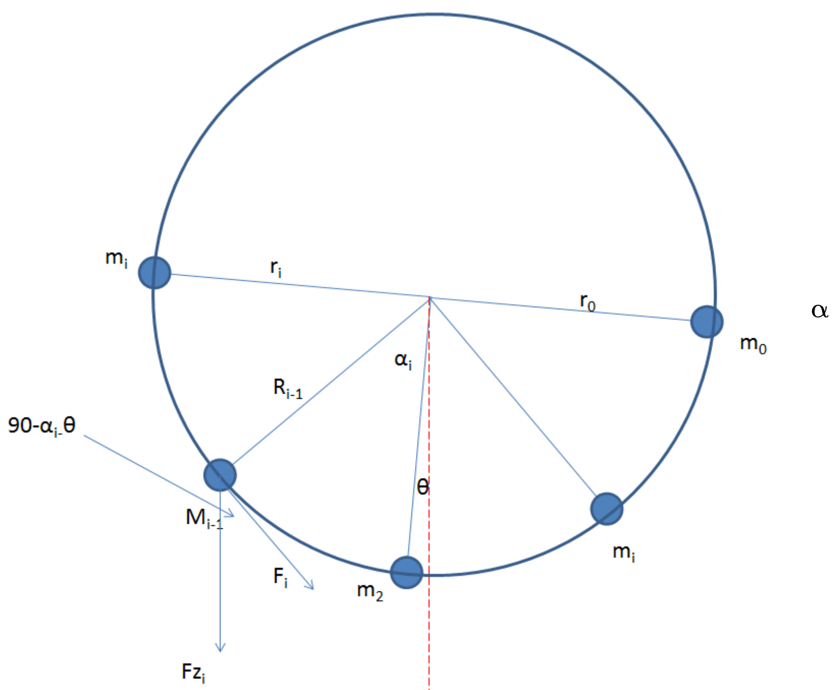
$\frac{d^2}{dt^2}\theta = k1 \cdot \theta$ la place tranformation gives $s^2 \cdot \theta = k1 \cdot \theta$

solving for s

$s = \begin{pmatrix} \sqrt{k1} \\ -\sqrt{k1} \end{pmatrix}$ levert

beweging differentiaal vergelijking met oplossing

$\theta(t) = a \cdot \cos(\sqrt{k1 \cdot t})$



$\tau = I \cdot \alpha$

stappen

τ berekenen alsfunctie van θ voor elk massapunt m_i

$F_i = m_i \cdot \sin(\alpha + \theta)$

deelbijdrage aan τ vanuit mi

$ti = F_i \cdot r_i$

$ti = m_i \cdot \sin(\alpha + \theta) \cdot r_i$

sommeren over m geeft τ

$$I = \sum_n \left[m_i \cdot \left(r_i\right)^2 \right]$$

$\tau = I \cdot \alpha$ met

$$\alpha = \frac{d^2}{dt^2}\theta = \frac{\tau}{I}$$

$$\alpha = \frac{d^2}{dt^2}\theta = \frac{\sum_{n=0}^{i} \left(m_i \cdot \sin(\alpha + \theta) \cdot r_i\right)}{\sum_n \left[m_i \cdot \left(r_i\right)^2 \right]} \qquad (1)$$

dus met

$$\frac{d^2}{dt^2}\theta = k1 \cdot \theta$$ volgt k uit (1)

levert daarna de slngerfrequentie

$$\theta(t) = a \cdot \cos\left(\sqrt{k1 \cdot t}\right)$$

θ