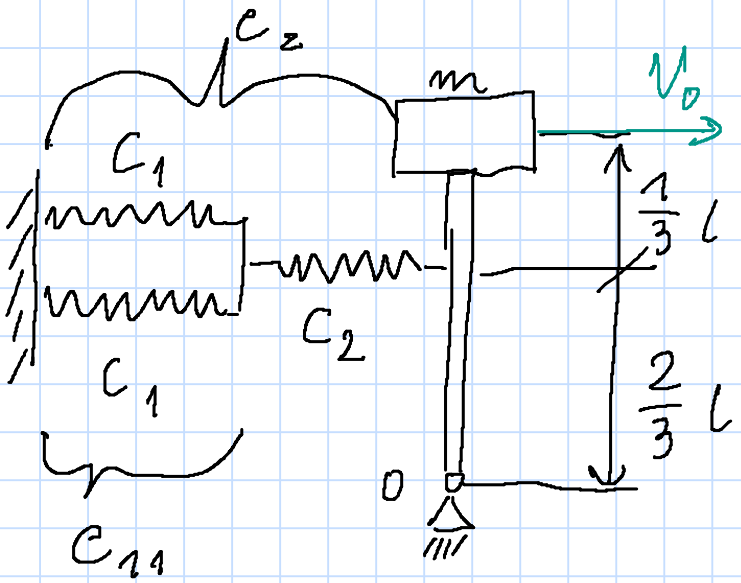


Дано

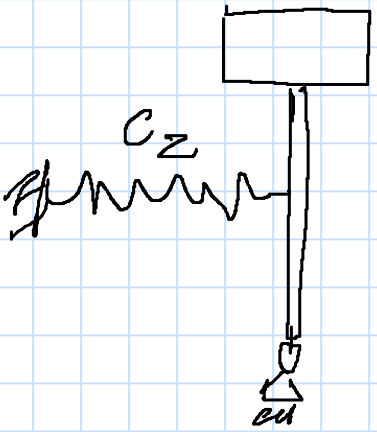
m, l, c_1, c_2

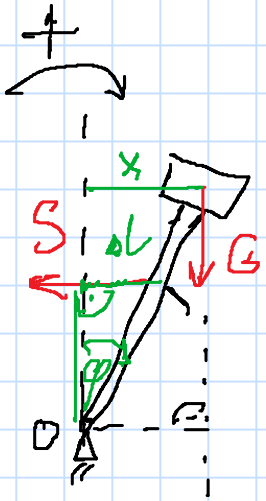
$$c_{11} = c_1 + c_1$$

$$c_{11} = 2c_1$$

$$\frac{1}{c_z} = \frac{1}{c_{11}} + \frac{1}{c_2}$$

$$c_z = \frac{2c_1 \cdot c_2}{2c_1 + c_2}$$





$$\Sigma J_O = \Sigma M_O$$

$$J_O = ml^2$$

$$x = l \sin\varphi$$

$$\ddot{\varphi} ml^2 = G \cdot l \sin\varphi - S \frac{2}{3} l \cos\varphi$$

$$G = m \cdot g \qquad S = c_z \Delta l$$

$$S = c_z \cdot \frac{2}{3} l \sin\varphi$$

$$\ddot{\varphi} ml^2 = mgl \sin\varphi - c_z \frac{2}{3} l \sin\varphi \frac{2}{3} l \cos\varphi$$

$$\sin\varphi = \varphi$$

$$\cos\varphi = 1$$

$$\ddot{\varphi} m l^2 = mg\frac{l}{2} - c_z\left(\frac{2}{3}l\right)^2 \cdot \varphi$$

$$\ddot{\varphi} + \frac{-mg\frac{l}{2} + c_z\frac{4}{9}l^2}{ml^2}\varphi = 0$$

$$\omega^2$$

$$\Delta < 0 : 0^2 - 4\omega_0^2$$

$$r^2 + \omega_0^2 = 0$$

$$r = \sqrt{-\omega_0^2}$$

$$r = \omega_0 \cdot i$$

$$\varphi = e^{\alpha t} + (A_1 \cos\beta t + A_2 \sin\beta t)$$

$$\varphi = A_1 \cos\omega t + A_2 \sin\omega t$$

$$\text{Для } t = 0 \quad \varphi_0 < 0 \quad \dot{\varphi}_0 = \frac{V_0}{l}$$

$$\downarrow$$

$$A_1 = 0$$

$$\frac{V_0}{l} = \omega A_2 \rightarrow A_2 = \frac{V_0}{\omega l}$$

$$\dot{\varphi} = -\omega A_1 \sin\omega t + \omega A_2 \cos\omega t$$

$$\varphi = \frac{V_0}{\omega \cdot l} \sin\omega t$$