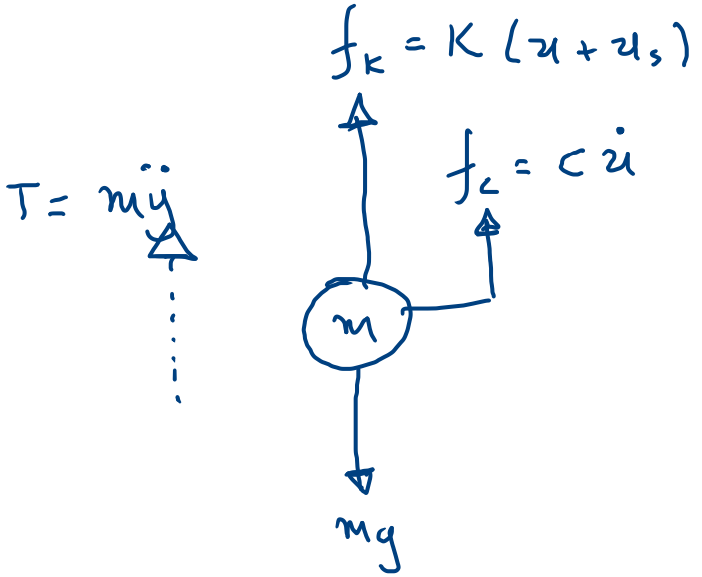
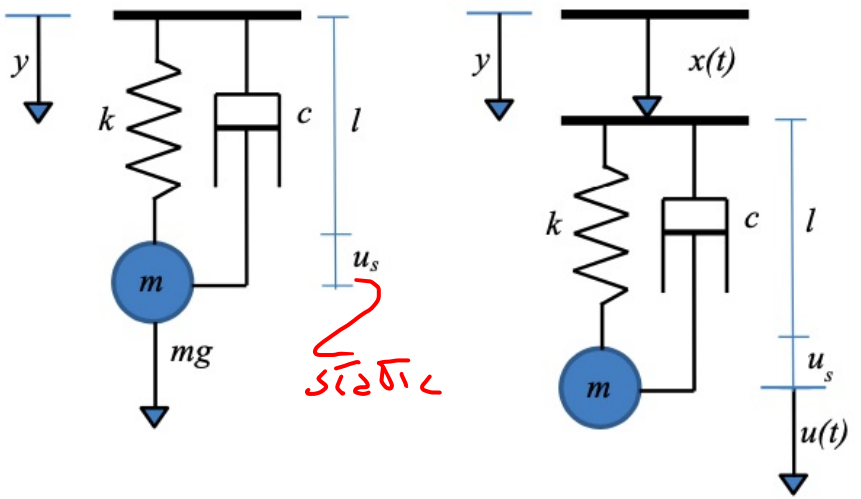


Example 1:

Formulate the equation of motion for the structural system presented in Figure 1.13.



$$y = x(t) + l + u_s + u(t)$$

$$\ddot{y} = \ddot{x} + \ddot{u}$$

$$T = -m\ddot{y} = -m(\ddot{x} + \ddot{u})$$

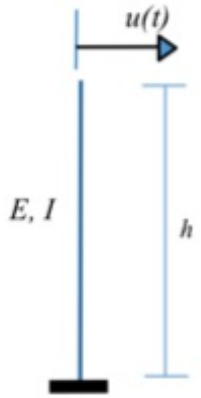
$|Ku_s| = |mg|$ (1)

$$F = -K(u_s + u) - c\dot{u} + mg$$

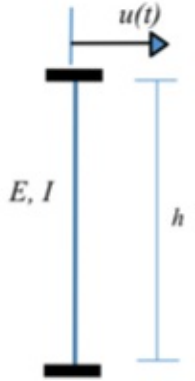
$$F = -Ku - c\dot{u}$$

$$F + T = 0 = -Ku - c\dot{u} - m\ddot{x} - m\ddot{u} = 0$$

$$m\ddot{u} + c\dot{u} + Ku = -m\ddot{x} \quad (2)$$

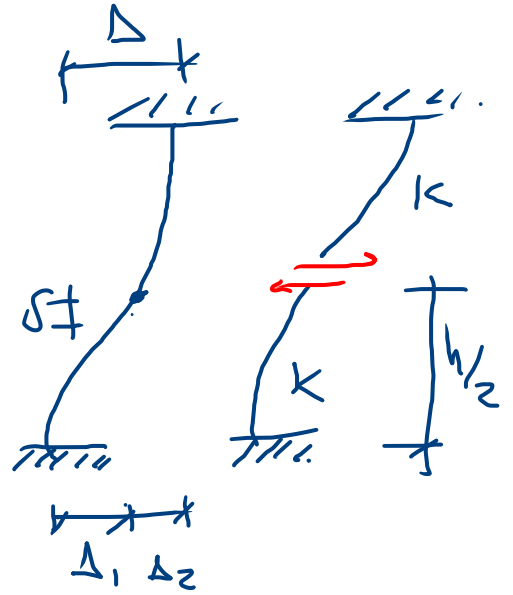


$$k = \frac{3EI}{h^3}$$



K_e

BMD

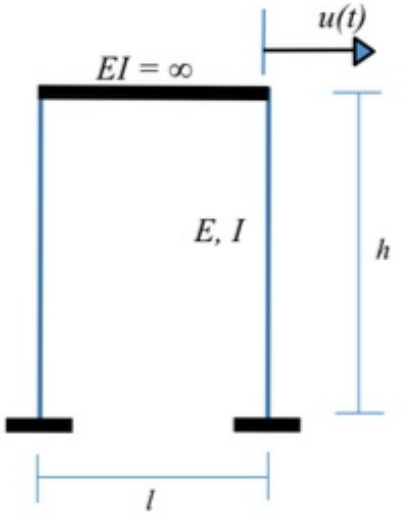


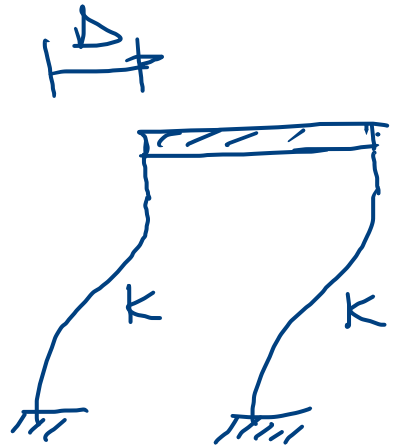
$$K = \frac{3EI}{(h/2)^3}$$

Series

$$K_e = \left(\frac{K+K}{KK}\right)^{-1}$$

$$K_e = \frac{12EI}{h^3}$$





P.

$$K = \frac{12EI}{h^3}$$

$$K_e = K + K$$

$$= \frac{24EI}{h^3}$$