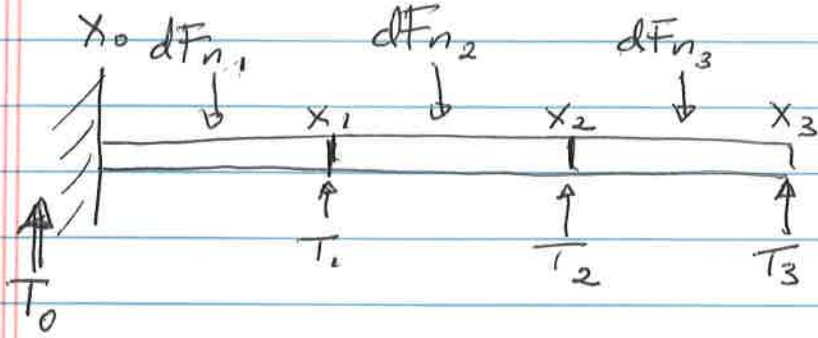


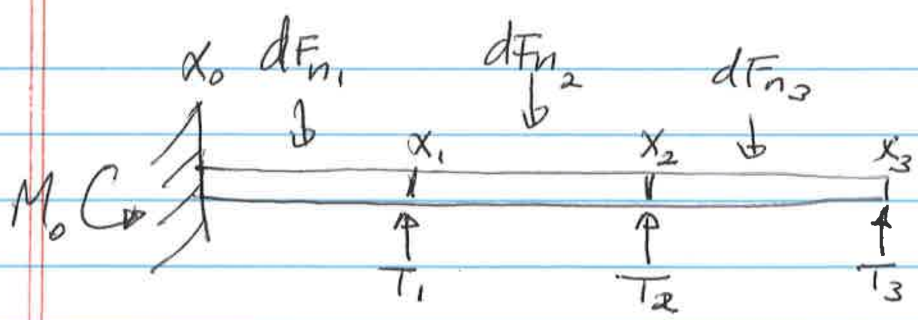

$$T_3 = 0$$

$$T_2 = T_3 + \frac{1}{2}\left(dF_{n_2} + dF_{n_3}\right)\left(x_3 - x_2\right)$$

$$T_1 = T_2 + \frac{1}{2}\left(dF_{n_1} + dF_{n_2}\right)\left(x_2 - x_1\right)$$

$$T_0 = T_1 + \frac{1}{2}\left(dF_{n_1} + \cancelto{0}{dF_{n_0}}\right)\left(x_1 - x_0\right)$$

$$T_0 = \frac{1}{2}\underbrace{\left(dF_{n_2} + dF_{n_3}\right)}_{N/m}\underbrace{\left(x_3 - x_2\right)}_{(m)} + \frac{1}{2}\left(dF_{n_1} + dF_{n_2}\right)\left(x_2 - x_1\right) + \frac{1}{2}\left(dF_{n_1} + \cancelto{0}{dF_{n_0}}\right)\left(x_1 - x_0\right)$$




$$M_3 = 0$$

$$M_2 = \cancel{M_3}^{\,0} - \cancel{T_3}^{\,0}(x_3 - x_2) - \left(\tfrac{1}{6} dF_{n_2} + \tfrac{1}{3} dF_{n_3}\right)(x_3 - x_2)^2$$

$$M_1 = M_2 - \underbrace{T_2}_{N}\underbrace{(x_2 - x_1)}_{m} - \underbrace{\underbrace{\left(\tfrac{1}{6} dF_{n_2} + \tfrac{1}{3} dF_{n_1}\right)}_{N/m}\underbrace{(x_2 - x_1)^2}_{m^2}}_{N-m}$$

$$M_0 = M_1 - T_1(x_1 - x_0) - \left(\tfrac{1}{6} dF_{n_1} + \tfrac{1}{3} dF_{n_0}\right)(x_1 - x_0)^2$$

$$= -\left(\tfrac{1}{6} dF_{n_2} + \tfrac{1}{3} dF_{n_3}\right)(x_3 - x_2)^2 - T_2(x_2 - x_1)$$

$$- \left(\tfrac{1}{6} dF_{n_2} + \tfrac{1}{3} dF_{n_1}\right)(x_2 + x_1)^2$$

$$- T_1(x_1 - x_0)$$

$$- \left(\tfrac{1}{6} dF_{n_1} + \tfrac{1}{3} \cancel{dF_{n_0}}^{\,0}\right)(x_1 - x_0)^2$$

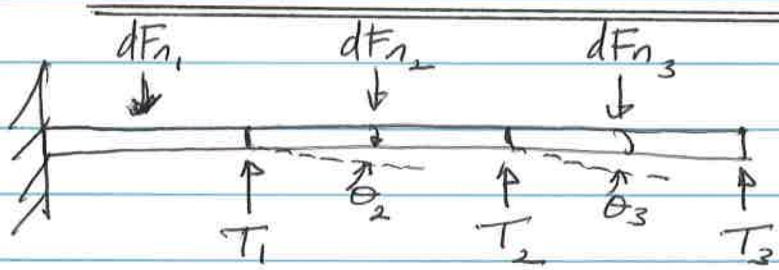
$$k_1 = \frac{M_1}{EI_1} \qquad k_2 = \frac{M_2}{EI_2}$$

$$k_z = -k_1 \sin(\theta_T + \vartheta) + k_2 \cos(\theta_T + \vartheta)$$

$$\frac{d^2u}{dx^2} = \frac{d\theta}{dx} = k_z \Rightarrow \text{curvature}$$

$$\frac{du_z}{dx} = -\theta_z \longrightarrow$$ ~~displ~~ slope

$$u_z = \int_{x_1}^{x_2} -\theta_z \, dx$$




$$\theta_1 = 0$$

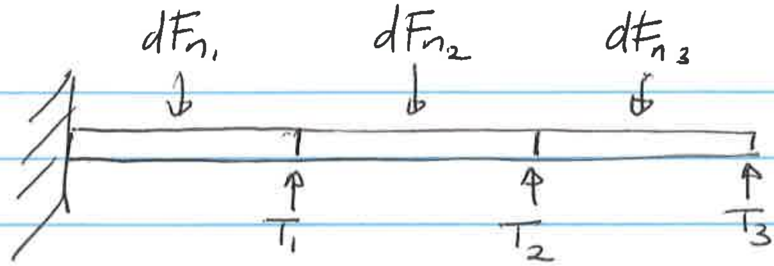
$$\theta_2 = \theta_1 + \tfrac{1}{2}(k_2 + k_1)(x_2 - x_1)$$

$$\theta_3 = \theta_2 + \tfrac{1}{2}(k_3 + k_2)(x_3 - x_2)$$

$$\frac{\Delta u}{\Delta x \cdot \Delta x} \qquad \Delta x$$

$$\frac{\Delta u}{\Delta x} = \theta$$

$$\theta_3 = \tfrac{1}{2}(k_2 + k_1)(x_2 - x_1) + \tfrac{1}{2}(k_3 + k_2)(x_3 - x_2)$$

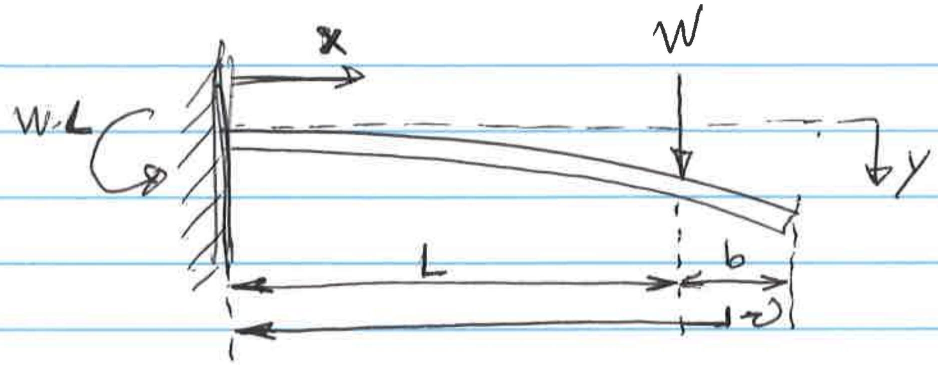



$u_1 = 0 \quad , \quad \theta_1 = 0$

$$u_2 = u_1 + \theta_1 (x_2 - x_1) + \left(\tfrac{1}{6} k_2 + \tfrac{1}{3} k_1\right)(x_2 - x_1)^2$$

$$u_3 = \underbrace{u_2}_{m} + \underbrace{\theta_2}_{\frac{u}{m}} \underbrace{(x_3 - x_2)}_{m} + \underbrace{\left(\tfrac{1}{6} k_3 + \tfrac{1}{3} k_2\right)}_{\frac{u}{m^2}} \underbrace{(x_3 - x_2)^2}_{m^2}$$

$$u_3 = \theta_1 (x_2 - x_1) + \left(\tfrac{1}{6} k_2 + \tfrac{1}{3} k_1\right)(x_2 - x_1)^2 + \theta_2 (x_3 - x_2) + \left(\tfrac{1}{6} k_3 + \tfrac{1}{3} k_2\right)(x_3 - x_2)^2$$




Deflection between support + Load:

$$y = \frac{Wx^2}{6EI}(3L - x)$$

Deflection beyond the load:

$$y = \frac{WL^2}{6EI}(3v - L)$$

Deflection at the load:

$$y = \frac{WL^3}{3EI}$$

Maximum deflection at end:

$$y = \frac{WL^2}{6EI}(2L + 3b)$$