

Homework 8 (Part 2)

21-11-20

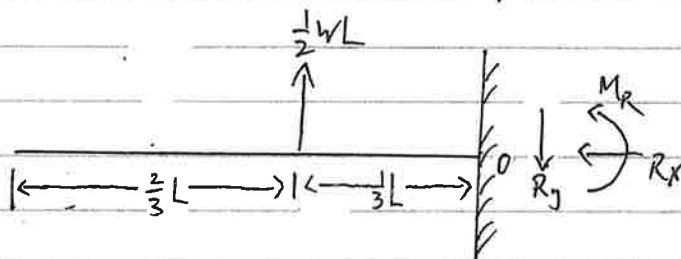
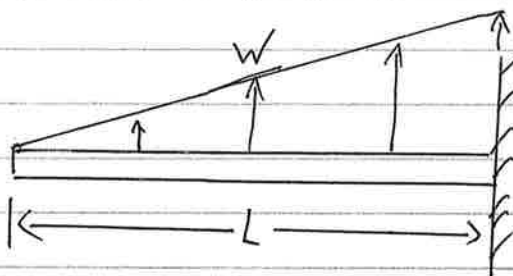
$$2. \frac{EI}{L^3} \begin{bmatrix} -12 & -6L & 12 & -6L \\ 6L & 2L^2 & -6L & 4L^2 \end{bmatrix} \cdot \begin{Bmatrix} V_1 \\ \theta_1 \\ V_2 \\ \theta_2 \end{Bmatrix} = \frac{WL}{2} \begin{Bmatrix} \frac{7}{10} \\ -\frac{L}{10} \end{Bmatrix} + \begin{Bmatrix} F_2 \\ M_2 \end{Bmatrix}$$

$$\begin{Bmatrix} V_1 \\ \theta_1 \end{Bmatrix} = \frac{WL^3}{EI} \begin{Bmatrix} \frac{1}{30} \\ -\frac{1}{24} \end{Bmatrix} \quad \begin{Bmatrix} V_2 \\ \theta_2 \end{Bmatrix} = \begin{Bmatrix} 0 \\ 0 \end{Bmatrix}$$

$$W \begin{Bmatrix} -\frac{12L}{30} + \frac{6L}{24} + 0 + 0 \\ \frac{6L^2}{30} - \frac{2L^2}{24} + 0 + 0 \end{Bmatrix} - \frac{WL}{2} \begin{Bmatrix} \frac{7}{10} \\ -\frac{L}{10} \end{Bmatrix} = \begin{Bmatrix} F_2 \\ M_2 \end{Bmatrix}$$

$$\begin{Bmatrix} -\frac{3LW}{20} \\ \frac{7L^2W}{60} \end{Bmatrix} - \begin{Bmatrix} \frac{7LW}{20} \\ -\frac{L^2W}{20} \end{Bmatrix} = \begin{Bmatrix} F_2 \\ M_2 \end{Bmatrix}$$

$$\begin{Bmatrix} F_2 \\ M_2 \end{Bmatrix} = \begin{Bmatrix} -\frac{WL}{2} \\ \frac{L^2W}{6} \end{Bmatrix}$$



$$\sum F_y = 0: \quad \frac{1}{2}WL + R_y = 0 \Rightarrow R_y = -\frac{WL}{2}$$

$$\sum M = 0: \quad M_R - \frac{1}{2}WL \cdot \frac{2}{3}L = 0 \Rightarrow M_R = \frac{WL^2}{6}$$