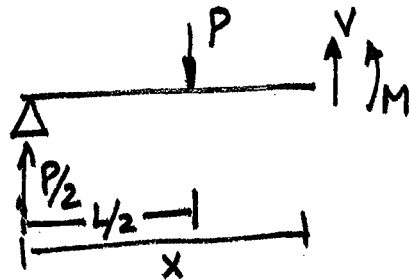


$$V = -P/2 \quad \Sigma F_y = 0 \quad x \leq L/2$$

$$M = P/2 x$$

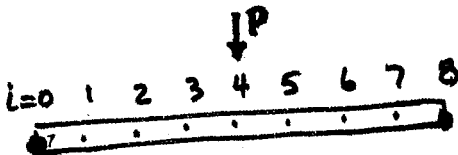


$$V = +P/2 \quad \Sigma F_y = 0 \quad x \geq L/2$$

$$M = P/2 x - P(x - L/2)$$



$$EI \frac{d^2 w}{dx^2} = M \Rightarrow w_i'' = \frac{M_i}{(EI)_i} \quad w(x) \quad x_i = i \Delta x$$



$$\Delta x = \frac{L}{8} \quad w_0 = 0 \quad w_8 = 0$$

$$\frac{w_{i+1} - 2w_i + w_{i-1}}{\Delta x^2} \approx w_i'' \quad O(\Delta x^2)$$

$$i=1 \quad \frac{w_2 - 2w_1 + w_0}{\Delta x^2} = \left(\frac{M}{EI}\right)_1$$

$$i=2 \quad \frac{w_3 - 2w_2 + w_1}{\Delta x^2} = \left(\frac{M}{EI}\right)_2$$

$$i=7 \quad \frac{w_8 - 2w_7 + w_6}{\Delta x^2} = \left(\frac{M}{EI}\right)_7$$

$$\begin{bmatrix} -2 & 1 & 0 & \dots & 0 \\ 1 & -2 & 1 & \dots & 0 \\ 0 & 1 & -2 & 1 & 0 \\ 0 & 0 & \dots & \dots & 0 \\ 0 & \dots & 0 & 1 & -2 \end{bmatrix} \begin{bmatrix} w_1 \\ w_2 \\ w_3 \\ \vdots \\ w_7 \end{bmatrix} = \begin{bmatrix} \left(\frac{M}{EI}\right)_1 \Delta x^2 \\ \left(\frac{M}{EI}\right)_2 \Delta x^2 \\ \vdots \\ \left(\frac{M}{EI}\right)_7 \Delta x^2 \end{bmatrix}$$

$$A \underline{w} = \underline{b} \quad \text{Implicit Numerical Technique}$$