

Cantilever Beam: Constant EI (2b wide & 2 high)

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$$p := -10000 \quad Y_{eildStress} := 30 \cdot 10^3$$

Initial Array (3rd and 4th terms from svbal). All at x=0

$$b := 2 \quad h := 3 \quad N := 1000$$

y
dy/dx=slope
d2y/d2x=M/EI
d3y/d3x=dM/dt=V/EI

$$E := 30 \cdot 10^6 \quad I := \frac{b \cdot h^3}{12} = 4.5$$

Slope Array

$$D(x, y) := \begin{bmatrix} y_1 \\ y_2 \\ y_3 \\ \frac{p}{E \cdot I} \end{bmatrix} \begin{array}{l} dy/dx=y'=slope \\ (dy/dt)'=dslope/dx \\ (d3y/d3x=(dM/dt)) \\ (d4y/d4x)'=(dV/dx)'=p/EI \end{array}$$

$$load(x, w) := \begin{bmatrix} 0 \\ 0 \\ w_0 \\ w_1 \end{bmatrix}$$

$$w := \begin{bmatrix} 0 \\ 0 \end{bmatrix} \quad score(x, y) := \begin{bmatrix} y_2 \\ y_3 \end{bmatrix} \quad sol := sbval(w, 0, 12, D, load, score)$$

$$sol = \begin{bmatrix} -0.005 \\ 8.889 \cdot 10^{-4} \end{bmatrix} \quad Iy := \begin{bmatrix} 0 \\ 0 \\ sol_0 \\ sol_1 \end{bmatrix} \quad ans := rkfixed(Iy, 0, 12, N, D) \quad Dist := ans^{(0)} \cdot 1 \cdot in$$

$$Def := ans^{(1)} \cdot 1 \cdot in$$

$$k := 0, 1 \dots N \quad YS_k := Y_{eildStress} \cdot 1 \cdot psi \quad \alpha_{Max} := - \left(\frac{ans^{(3)} \cdot E \cdot I}{\frac{2}{3} \cdot b \cdot h^2} \right) \cdot 1 \cdot psi$$



