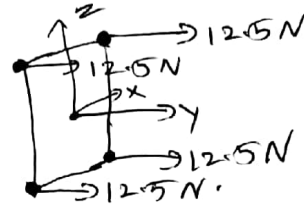
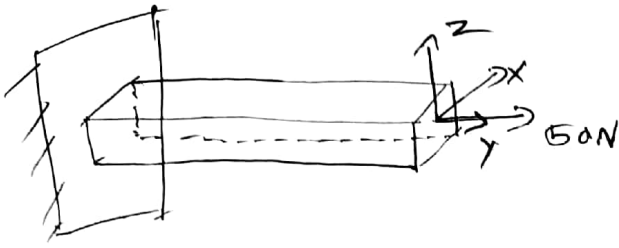


## Tensile Load:



## Exact Solution:

$$\sigma = E \epsilon$$

$$\frac{F}{A} = E \frac{dL}{L}$$


$$L = 2\text{ m} \quad A = 0.04\text{ m}^2 \quad E = 75 \times 10^9\text{ Pa}$$

$$\therefore dL = \frac{F \times L}{E \times A}$$

$$= \frac{50 \times 2}{75 \times 10^9 \times 0.04}$$

$$= 3.3 \times 10^{-8}\text{ m}$$

In the B2-element Program, a load of 50N has been applied at the 4 free nodes (in ~~x~~-direction).

The fixed 4 nodes are constrained using Penalty method described in the book by Carrera.  And also the ~~x~~ and z displacements ~~are~~ ~~constrained~~ of the free nodes are also constrained using the Penalty technique. (By penalizing the  $K_{xx}$  and  $K_{zz}$  components).

By solving this program, the displacement ( $u_y$ ) reaches to a value of  $2.25 \times 10^{-8} \text{ m}$ .