1. Assuming a quadratic one-dimensional displacement function, determine the interpolation function matrix \([N]\) (shape function) for a three node bar element shown below. \(L\) is the length of the element.

2. Analyze the bar shown below for displacement at B and average stresses in bar AB and bar BC.

\(\Delta T = +100\,^\circ C\)
\(E = 200\, \text{GPa}\)
\(\alpha = 2 \times 10^{-6}\)
3. Analyze the wall bracket shown in the figure and calculate the forces and stresses in all the members. All joints are pin jointed. Assume $E=200$ GPa