

CE595: Finite Elements in Elasticity

Homework No. 5

Date Due: Feb. 25, 2009

For the triangular element shown below, develop

- 1) The shape function matrix $[\bar{N}]$ with respect to the generalized coordinates
- 2) The shape function matrix $[N]$ with respect to nodal displacement. Develop the matrix using one method (interpolation approach), and then check it using second method (direct approach).
- 3) The strain-displacement matrix $[\bar{B}]$ with respect to the generalized coordinates
- 4) The strain-displacement matrix $[B]$ with respect to the nodal displacements
- 5) The plane stress elasticity matrix assuming $E=29000$ ksi, $\nu=0.3$, and thickness=0.25 in.
- 6) The stress-displacement matrix $[DB]$ with respect to the nodal displacement
- 7) The generalized element stiffness matrix $[\bar{K}]$
- 8) The element stiffness matrix $[K]$

