Problem 1 (10 points):

The four-node plane strain element shown is subjected to the constant stresses

\[ \tau_{xx} = 20 \text{ psi} \]
\[ \tau_{yy} = 10 \text{ psi} \]
\[ \tau_{xy} = 10 \text{ psi} \]

Calculate the nodal point displacements of the element.
**Problem 2 (20 points):**

Consider the element 4 in Fig. E4.9 in the textbook (p. 180-181).

(a) Show explicitly that

\[ F^{(4)} = \int_{V^{(4)}} B^{(4)^T} \tau^{(4)} dV^{(4)} \]

(b) Show that the element nodal point forces \( F^{(4)} \) are in equilibrium.

**Problem 3 (10 points):**

Exercise 4.15, p. 221-222 in the textbook.