

INTRODUCTION TO THE FINITE ELEMENT METHOD

Department of Mechanical Engineering

National Taiwan University

Fall 2019

HOMEWORK #7

Due December 19, 2019

1. (Reddy) Problem 8.4

Problem 8.4: Calculate the linear interpolation functions for the linear triangular and rectangular elements shown in Fig. P8.4.

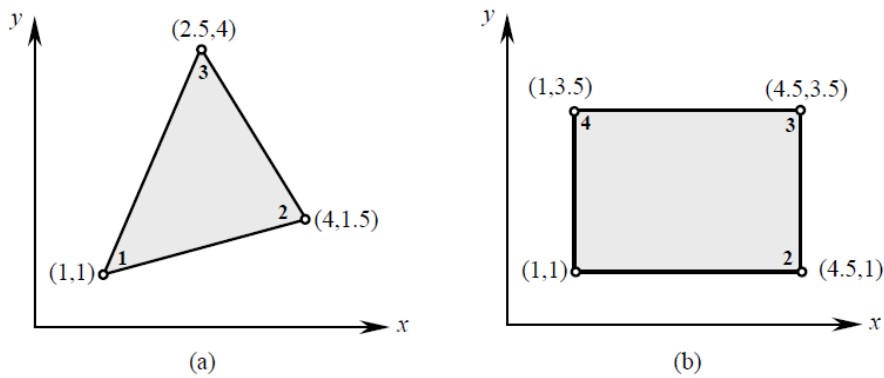


Figure P8.4

2. (Reddy) Problem 8.11

Problem 8.11: Give the assembled coefficient matrix for the finite element meshes shown in Figs. P8.11(a) and P8.11(b). Assume 1 degree of freedom per node, and let $[K^e]$ denote the element coefficient matrix for the e th element. Your answer should be in terms of element matrices K_{ij}^e .

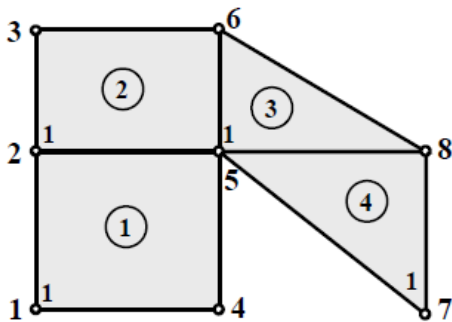


Figure P8.11(a)

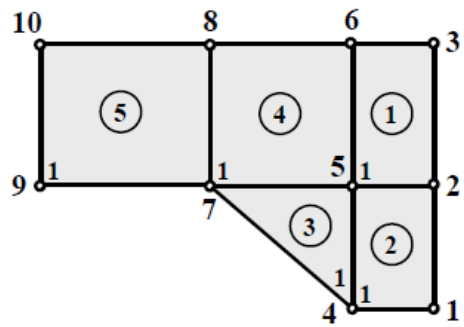


Figure P8.11(b)

3. (Reddy) Problem 8.21

Problem 8.21: Solve the Laplace equation for the unit square domain and boundary conditions given in Fig. P8.21. Use one rectangular element.

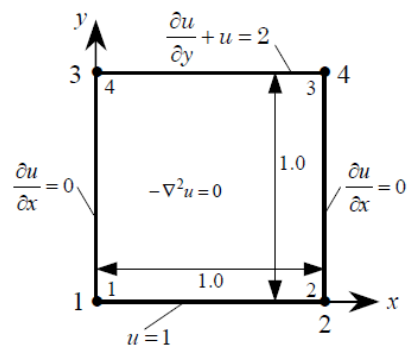


Figure P8.21