2.094 Finite Element Analysis of Solids and Fluids
Spring 2008

2.094

FINITE ELEMENT ANALYSIS OF SOLIDS AND FLUIDS

SPRING 2008

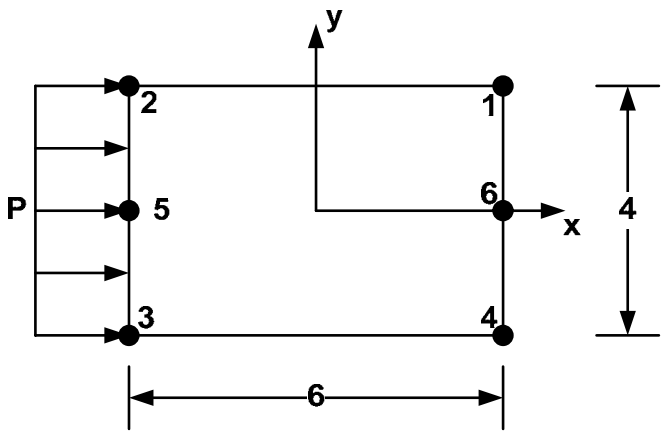
Homework 4

Instructor: Prof. K. J. Bathe

Assigned: 02/28/2008
Due: 03/06/2008

Problem 1 (20 points):

Consider the 6-node finite element shown.



Rectangular plane stress finite element, thickness = 0.1

(a) Establish all finite element displacement interpolation functions, i.e. the $h_i(x, y)$ for $i = 1, \cdots, 6$.

(b) Show explicitly that when your functions are used the element can displace rigidly by 2.0 in any direction and rotate rigidly by 60 degrees.

(c) Calculate the nodal loads at all nodes, corresponding to the constant pressure ***P***.

Problem 2 (20 points):

Exercise 5.16 in the textbook, page 393.