

2.093 Computer Methods in Dynamics

FALL 2002

Homework 4

Problem 1 (10 points):

Exercise 5.16, textbook, K.J. Bathe. *Finite Element Procedures*. Prentice Hall, Inc., Englewood Cliffs, NJ, 1996. (Page 393)

Problem 2 (20 points):

In a linear elastic material and static analysis ($E = 2 \times 10^5 \text{MPa}$, $\nu = 0.3$, $\rho = 1000$) consider the circular plate shown below.

- Analyze the plate using an analytical (approximate) solution.
Refer to *Theory of plates and shells* by S. P. Timoshenko (page 55)
- Analyze the plate using ADINA with
 - 4 node elements
 - 9 node elements

- With the 4- node element use meshes of 4×12 and 8×24 elements.
- With the 9- node element use meshes of 4×12 and 8×24 elements.

Compare your ADINA results with the analytical solution in a)

