

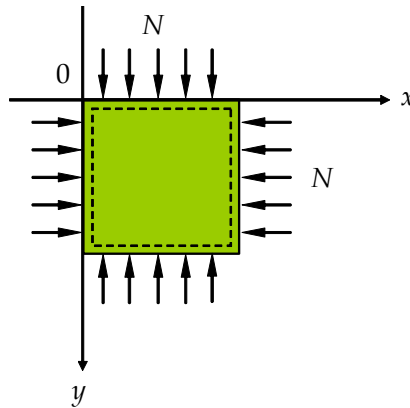
## 2.081J/16.230J Plates and Shells

Homework #3

Due date: class on Monday March 6

### PROBLEM 1

A simply-supported square ( $a \times a$ ) plate is subjected to biaxial compression of the intensity  $N$ .



- (a) Prove that the following pre-buckling solution satisfy all equations in the in-plane direction:

$$N_{\alpha\beta}^0 = \begin{vmatrix} N & 0 \\ 0 & N \end{vmatrix}$$

Given  $a$  and  $D$ , find the buckling load using:

- (b) Finite difference method with 4 and 16 elements  
(c) Raleigh-Ritz quotient  
and compare the results.