Physics 3345 **Professor Scalise**
Fall 2000 **Assignment #8**

Due: Monday 30 October 2000

Read Shankar - Chapters 8 and 9

1. (a) Find the moment of inertia (zz-component) of an equilateral triangular homogeneous plate of mass M, side L, and thickness T about an axis through the center of mass and perpendicular to the plate.

   (b) about an axis through a vertex and perpendicular to the plate.

2. Find the moment of inertia (zz-component) of a disk of mass M, radius R, and thickness T about the symmetry axis of the disk if the density of the disk varies radially as $\rho(r) = Ar$. (Solve for A first.)

3. (a) Find the eigenvalues and eigenvectors of the 3×3 matrix:

$$\begin{pmatrix} 1 & 1 & 0 \\ 1 & 0 & 1 \\ 0 & 1 & 1 \end{pmatrix}$$

   (b) Since the matrix is real and symmetric, the eigenvectors should be mutually perpendicular. Verify this.