Phys 242 Homework

Problem Set 4

Due Wednesday, September 27

1. Thornton and Rex 3.3
2. Thornton and Rex 3.5
3. Thornton and Rex 3.14
4. Thornton and Rex 3.20
5. Thornton and Rex 3.29 This is the 3-dimensional calculation of the number of the number of standing waves in the frequency interval from f to f+df. To do the problem consider a 3-dimensional number space (instead of the 1-dimensional line we used in class). The radius in this number space is $r = \sqrt{n_x^2 + n_y^2 + n_z^2}$. How many points are in the spherical shell between r and r+dr? Then continue on to do the problem.
6. Thornton and Rex 3.30 This is the origin of the $c/4$ factor mentioned in class. To do this problem consider a spherical cavity of radius r centered at the origin with a small hole on the x-axis. Consider an EM wave at some angle θ from the origin. What is the velocity component of the EM wave along the x-axis? Then integrate over the sphere. Then continue on to do the problem.