PHGN 462 Homework 8

1) Pollack and Stump 12.1. This one is neat because it shows that you can get from the postulate about the constancy of the speed of light right to the Lorentz transforms (with some very reasonable assumptions along the way).

A little hint: It's basically saying that in different frames, the distance traveled by light in every direction is c times the time elapsed. That means you can write an expression involving t and c about the distance to some point on an arbitrary sphere.

2) Pollack and Stump 12.7. If you don't know what a group is in a math context, start by looking that up on Wikipedia or elsewhere. This problem is having you prove explicitly that Lorentz transforms have closure (combos of two or more Lorentz transforms are still Lorentz transforms) and have an inverse (if you have a Lorentz transform L, there exists an L^{-1} that will take you back to where you started), two of the main features of groups.

3) Pollack and Stump 12.8. If it seems short and easy, that's because it is. Don't drive yourself nuts.

4) Pollack and Stump 12.16.