Some more questions.

1. I have a vague idea what L^1 and L^2 look like, but every other L^p space baffles me. Could you tell me what these spaces look like? Building off of that: why should L^∞ be the thing that we define it to be?

2. I don't actually "understand" the proof of the Holder inequality given in class (or, for that matter, the one we did in the homework); I can follow every step, but it seems strange, weird, and mechanical. Even the one in the exercise felt like I'd magically stumbled upon the right thing when I finished it. Is there a better proof out there that appeals to some deeper fact, or is this simply some strange fact that glues all of the L^p spaces together? If such a proof is inaccessible to me, then could you try to explain why the Holder inequality should be true in rough terms? (Pictures would be nice, I like pictures.)

3. I kind of begin to see what the Radon-Nikodym theorem means; it seems that in the case where one measure is a function of another, we're somehow taking a derivative in the familiar sense. However, it seems like a strange abstractification of this idea, feeling as if it is just there to round out the integration theory. Could you please give me an "application" of this theorem?

Thanks for putting up with my pestering. :P
-Max