1. A positive charge $q$ is located at the center of a spherical conducting shell of an inner radius $R_i$ and an outer radius $R_o$. Determine and sketch electric field intensity $E$ as a function of the radial distance $R$ from the point charge, ranging from $R = 0$ to $R > R_o$. 
2. Three impedances of value 4 + j3 ohms are connected in Y. For balanced line-to-line voltages of 208 V, find the line current, the power factor, real power, reactive power, and apparent power.