1. Show that the wave functions for the one-dimensional motion of a free particle (use periodic boundary conditions) form a set of orthonormal functions. (proof)

2. Can you show that equation for calculating energy of particle inside of **finite potential well** $\tan\left(\frac{a\sqrt{2mE}}{\hbar}\right)=\frac{2\sqrt{E(U_0-E)}}{2E-U_0}$ give the correct values for energy for **infinite potential well** $E_n=\frac{(\pi\hbar)^2}{2Ma^2}\cdot n^2$, $n=1, 2, \ldots$ in limit $U_0 \to \infty$? (proof)

Why the wavefunction value inside of walls of infinitely deep potential well should be equal to 0 ? (proof)

3. How looks like the electron configuration for O, Al and Li atoms? (explanation)

PS!
http://parsek.yf.ttu.ee/~physics/QM.html