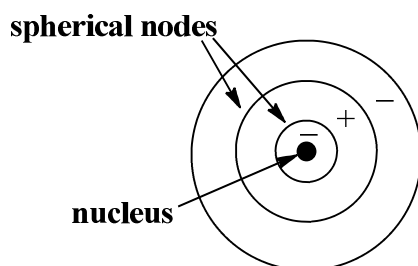
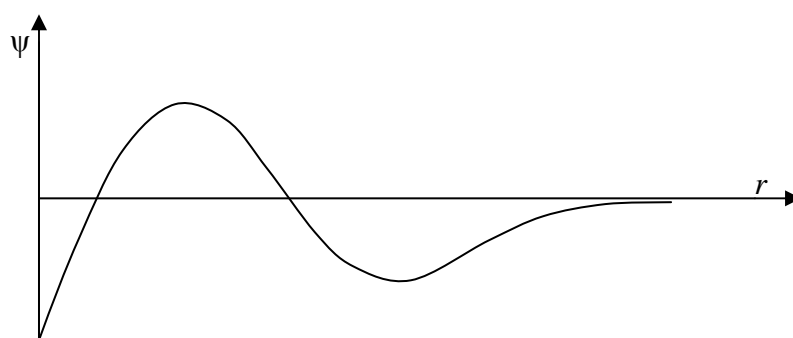


- Sketch the wavefunction of the 3s atomic orbital as described below. Clearly mark all nodes and the relative sign (+ or -) of the wavefunction.

a) using lobe representations



b) by plotting wavefunction *versus* distance from the nucleus



Explain the significance of (a) the lobes, (b) the nodes and (c) the sign of the wavefunction, in terms of the probability of finding an electron at a given point in space relative to the nucleus.

The lobes define the volume within which there is a certain probability of finding the electron (usually 95%).

The nodes represent surfaces where there is zero probability of finding the electron.

The sign of the wavefunction is not relevant to the probability of finding the electron. The probability distribution depends on the square of the wavefunction, which is always positive.