## Exercise 4.3 Drawing Atomic Orbitals

## **General Instructions**

- You must draw Cartesian axes to show the orientation of each orbital; however, you may rotate the axes if it makes your picture clearer/easier to draw. (The x axis does not have to be left/right. The y axis does not have to be up/down. The z axis does not have to be forward/backward.)
- You must use shading to indicate relative phases of the orbital lobes.
- Do not show radial nodes.
- All pictures within the same question must be drawn to the same scale.
- 1. Sketch the full set of 2p orbitals and label them with their Cartesian labels.

2. Sketch the full set of 3d orbitals and label them with their Cartesian labels.

3. Sketch a 2s orbital, a 3s orbital and a 3p orbital for the same atom. Label each orbital.