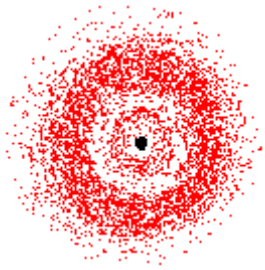
ORBITALS

1. True

2. True



3. False. The diagram certainly shows an s orbital, but if you look at it carefully, you will see a slightly higher density of electrons just inside the main high-density area. In a 1s orbital, that doesn't exist. Refer back to the diagram on http://www.chemguide.co.uk/atoms/properties/atomorbs.htm

4. True

5. True

6. False. The diagram is a p orbital, but what this shows is the region of space occupied by the electron(s) for, say, 95% of the time. You can't know what the electrons are doing within this space.

7. True. There are 9 3-level orbitals exactly as described in the question, each of which can hold 2 electrons.

8. True. There isn't a similar example to this question on the page you have just read, but you should be able to work it out as a comprehension exercise. You have to fit 20 electrons into the lowest possible energy levels. At calcium that means that the 1s, the 2s and all the 2p, the 3s and all the 3p will be filled (that's 18 electrons so far). Then you are told that at calcium, the 4s fills before the 3d.

   If you have got this question right, you shouldn't have much problem with the next couple of pages which explore this in a lot more detail.

You may wonder why there are far more true answers than false ones. There is always a problem with false statements. If you write them so that they sound reasonably convincing, there is a real danger that, in the future, students will remember the false statement rather than the truth!