**Foot 2.4**…Quite a lot of important, experimentally relevant physics results from the penetration of electrons into the nucleus.  We will return to this soon.

**Foot 4.3**…get a handle on quantum defects numerically.

**Foot 4.6**…put everything together and think about how fine structure and quantum defects give rise to experimentally relevant spectra.

**Foot 4.10**…This is called the "shooting method" for solving the Schrodinger equation.  It is extremely useful in many scenarios, including solving what happens in molecular potentials.  You can do more in Excel than you might think!

- Read, but do not complete, part a
- Do parts b(1)-(6)

Another method for solving a 1D Schrodinger equation, like the radial equation, is the Numerov method. The Numerov method is useful when the energy of the eigenstates are known.  For example, the quantum defects for the alkali atoms have been precisely determined, and thus the Numerov method can be used to compute wavefunctions for the outer shell electron.  If you want to know more, check http://massey.dur.ac.uk/jdp/talks_posters/RydbergWavefunctions.pdf and pages 22-24 in *Rydberg Atoms* by Thomas Gallagher.