

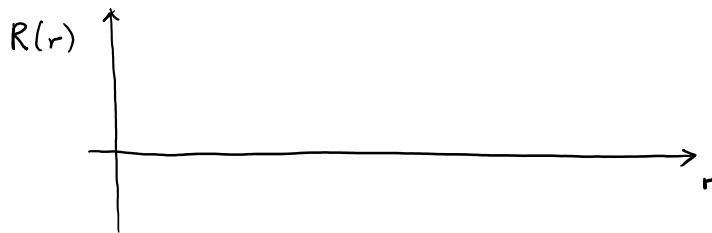
Visualizing a wave fn

Consider the wavefn

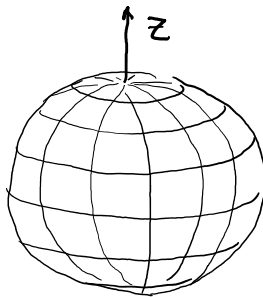
$$\Psi(r, \theta, \phi) = R(r)Y(\theta, \phi) = \frac{1}{a^{3/2}} \left(1 - \frac{r}{6a}\right) \left(\frac{r}{a}\right) e^{-r/3a} \cos \theta$$

where a is the Bohr radius $\approx 0.5 \times 10^{-10}$ m

- a) Sketch a graph of $R(r)$. Try to get the nodes in the right place and the shape about right.



- b) Use shading to represent the phase and magnitude of $Y(\theta, \phi)$ on the surface of a sphere.



- c) Combining insights from parts a & b, sketch an isoprobability contour in the x-z plane.

