

Worksheet # 3

Wednesday, January 24, 2024

Name**Question (5 pts):**

The first several radial functions $R_{nl}(r)$ of the hydrogen atom are given by

$$R_{10}(r) = 2a_0^{-3/2} e^{-r/a_0}$$

$$R_{20}(r) = \frac{1}{\sqrt{2}} a_0^{-3/2} \left(1 - \frac{r}{2a_0} \right) e^{-r/2a_0}$$

$$R_{21}(r) = \frac{1}{\sqrt{6}} a_0^{-3/2} \left(\frac{r}{2a_0} \right) e^{-r/2a_0}$$

Sketch (qualitatively) these functions (analyze - where is the maximum, what is the value at the maximum, how many zeroes, ...). Comment on the probability to find a particle at small r 's in these states and any other interesting trends you find.