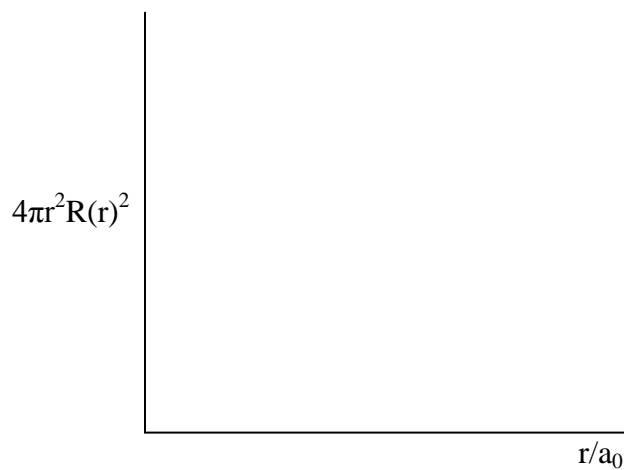
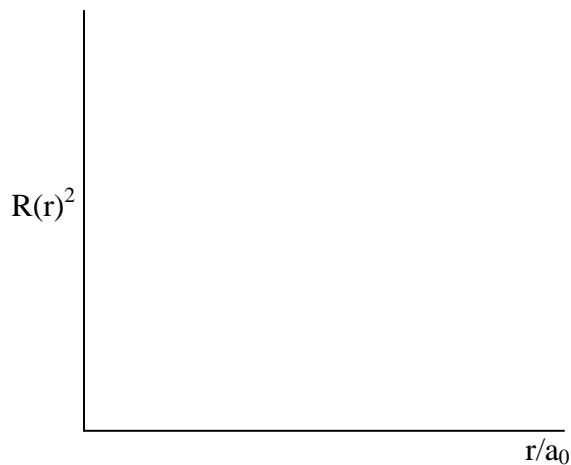
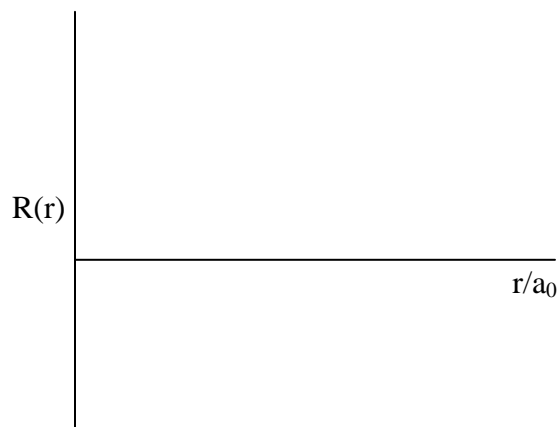
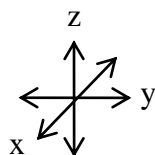
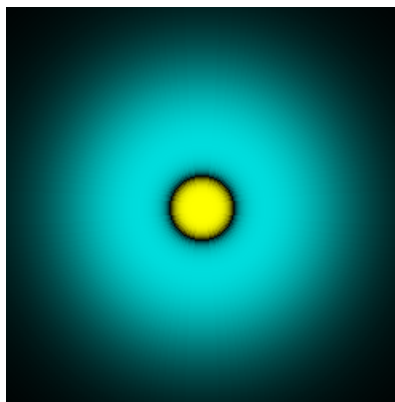


Working with Hydrogen Atom Orbitals

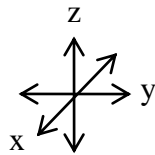
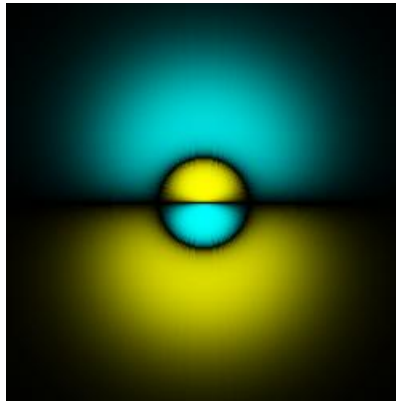
Complete the following steps for each of the H-atom orbitals pictured below:

1. Identify the orbitals. Be sure to include the orientation of the orbital (i.e., $3p_x$, etc.).
2. List the values of the 3 quantum numbers n , l , and m_l .
3. Determine the number and type of nodes for each orbital.
4. Draw plots of the radial portion of the wave function, $R(r)$, the probability density, $R(r)^2$, and the radial probability distribution, $4\pi r^2 R(r)^2$, vs. r for these orbitals.

A.



B.



$R(r)$

r/a_0

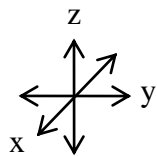
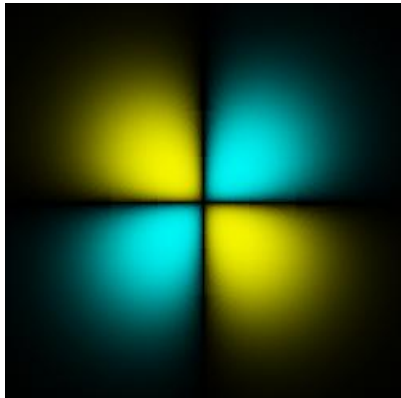
$R(r)^2$

r/a_0

$4\pi r^2 R(r)^2$

r/a_0

C.



$R(r)$

r/a_0

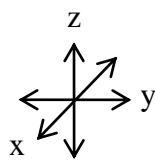
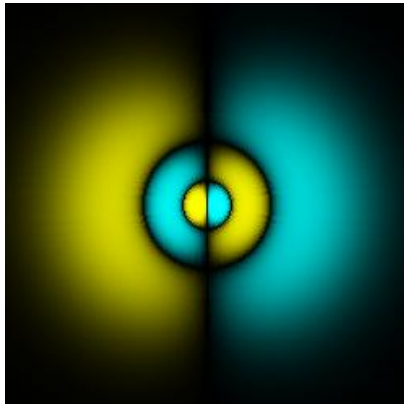
$R(r)^2$

r/a_0

$4\pi r^2 R(r)^2$

r/a_0

D.



$R(r)$

r/a_0

$R(r)^2$

r/a_0

$4\pi r^2 R(r)^2$

r/a_0