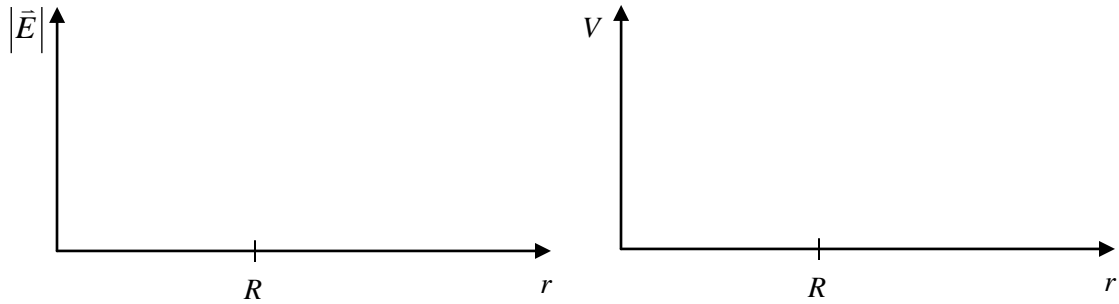


Lesson #10: Electrostatic Boundary Conditions

Name: _____

Study Section 2.3.5 and take another look at Example 2.7, the uniformly charged spherical shell. We found the electric field for this charge distribution last lesson. Then answer these questions:

1. Plot the electric field magnitude and the electric potential as functions of r , the radial distance from the center of the shell.



2. Note that the electric field is discontinuous at $r = R$. Explain why the electric field is always discontinuous where there is a surface charge present (think about Gauss's law).
3. By how much is the electric field discontinuous at $r = R$? That is, what is the difference in the field strength as you go from just inside to just outside the sphere?
4. Show that the amount of field discontinuity at $r = R$ is consistent with the results of Section 2.3.5. Your explanation should refer to any relevant equations which apply from that section.
5. Show that the behavior of the electric potential at $r = R$ is also consistent with the results of Section 2.3.5. Again, refer to any relevant equations which apply.