PHYS 2102

Exam 1

Spring 2001- 01

Dr. Aktas

Name :_____

SS # : _____

You have five questions, 20 points each.

This is a closed book exam. I understand I am not to use any notes or information other than on this exam sheet. I may use a pocket calculator but only for the purpose of numerical calculation. I accept the responsibility to know and observe the requirements of the UNC-Charlotte Code of Student Academic Integrity.

_____

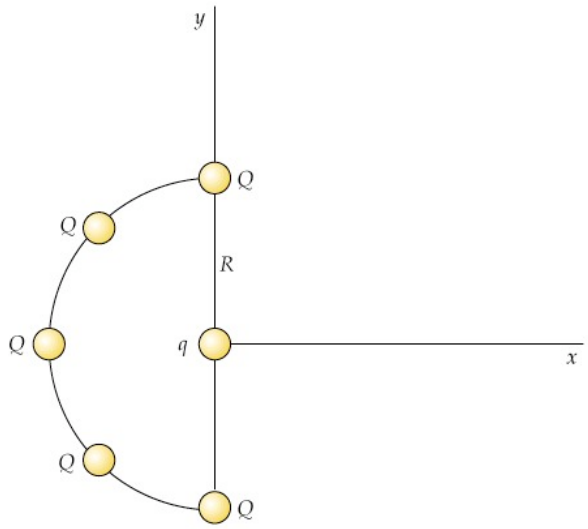
_

Signature

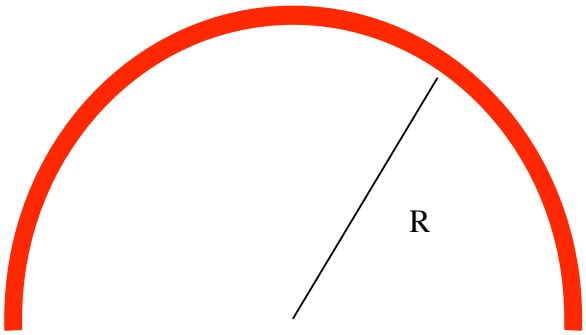
Good luck

Show all of your work. Do not skip steps. First write down the relevant equations then substitute the numbers if necessary.

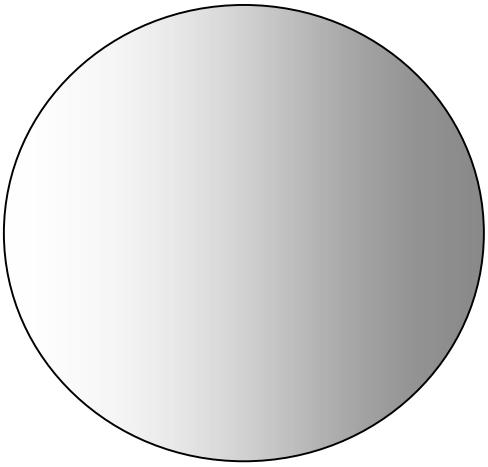
1. Five equal charges Q are equally spaced on a semicircle of radius R as shown in Figure below. Find the force on a charge q located at the center of the semicircle.



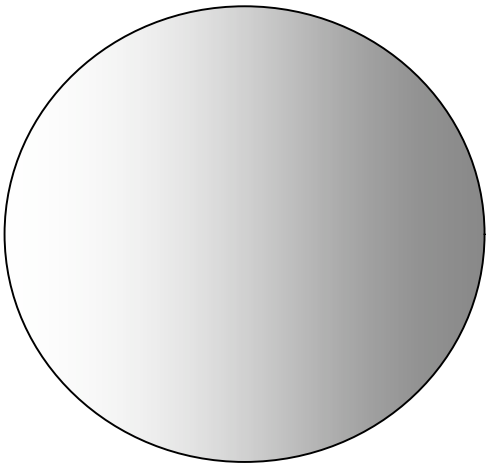
2. Calculate the electric field of a semicircular charge distribution with charge Q and radius R at its center. Show your all steps.



3. Consider a solid uniformly charged cupper sphere with charge Q radius R. Calculate the electric field for the regions (a) outside ($r > R$), and (b) inside ($r < R$), of the sphere. Show your all steps.



4. Consider the spherical charge in problem 3. (a) Calculate the potential of the spherical charge inside and outside of the sphere. (b) Calculate the electric field of the spherical charge from the potential in part (a) for the inside and outside regions. Compare your electric field result with the one in problem 3.



5. Calculate the capacitance of a cylindrical capacitor with inner radius a, outer radius b, and height h. Show your all steps.