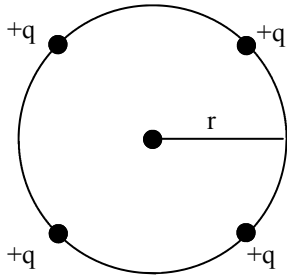
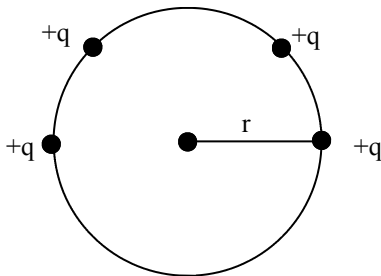


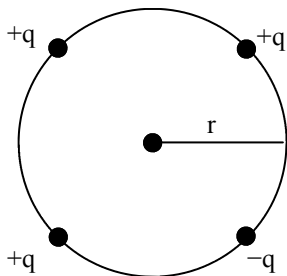
These questions will help you on the test. I will go over them at the beginning of class, but it will ABSOLUTELY help you if you try this on your own, first.



1. Imagine four equal positive charges placed around a circle. Each charge is a 45° to each axis. The circle has a radius of "r".
 - A. Using only variables, what is the magnitude of the Electric field due to one charge at the center of the circle?
 - B. Using arrows, draw the electric fields due to each charge at the center of the circle.
 - C. Looking at your arrows and remembering that electric fields are vectors, what is the net electric field at the center?
 - D. Using only variables, what is the voltage due to one charge at the center?
 - E. What is the total voltage at the center of the circle due to all four charges?



2. Now imagine that two of the charges are moved as shown.
 - A. Using arrows, draw the electric fields due for each of the four charges.
 - B. Realizing that the angle between the top two charges is 90° , calculate the total electric field at the center (using variables).
 - C. Calculate the total voltage at the center.



3. Now the charges are position back at the 45° points, but one of them is changed to a negative charge.
 - A. Using arrows, draw the electric fields for each of the charges.
 - B. Calculate the net electric field a the center (using variables).
 - C. What is the total voltage, now?