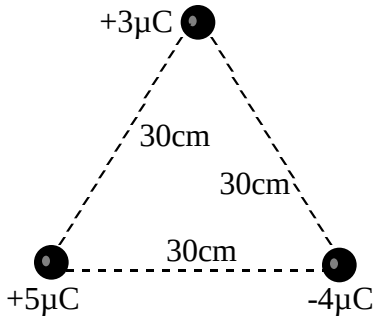
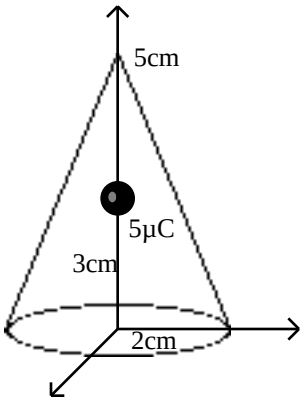
Name:_____

Solve the following problems in the space provided. Use the back of the page if needed. Each problem is worth 20 points. You must show your work in a logical fashion starting with the correctly applied physical principles which are on the last page. Your score will be maximized if your work is easy to follow because partial credit will be awarded. **For full credit you must explain clearly what you are doing especially if your solution involves symmetry arguments or uses Gauss's Law.**

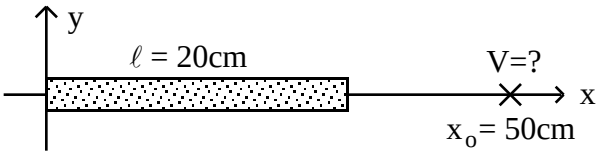
1. (a)Find the magnitude and direction of the electric force on the 3μC charge. (b)Find the magnitude and direction of the electric field felt by the 3μC charge (a=5.00cm)



2. A 5.00μC charge is located 3.00cm upward from the center of the base of a cone of radius 2.00cm and height 5.00cm. Find the total electric flux leaving the volume enclosed cone.



3. A 20cm long wire has a uniform charge density, λ=3.00C/m, and has one end at the origin. Find the electric potential at a distance x_o=50cm from the origin.



4. Define electric potential. Give two reasons why it is easier to deal with electric potential than electric field.

5. Find energy needed to assemble the charges in problem 1.