1. (2 points each, 2 points bonus for the graph) A hollow conducting sphere of radius 10 cm has a uniform charge distribution of -5nC/cm^2 on it (draw a diagram). K=9.0E9N.m^2 /C^2

   a. Calculate the amount of total charge on it.

   Q=

   b. Calculate the electric field inside the sphere at 5cm from the center. What is the direction?

   $E_{magnitude}$=
   $E_{direction}$=

   c. Calculate the magnitude of the electric field outside the sphere at a distance 20cm from the center. Show the direction.

   $E_{magnitude}$=
   $E_{direction}$=

   d. What is the direction and magnitude of the coulomb force on a charge -5nC located at 20cm from the center of the sphere?

   $F_{magnitude}$=
   $F_{direction}$=

   e. Calculate the total electric flux around the sphere at 20cm from the center.

   ϕ=