

## *Electric Fields*

1. A charge produces an electric field at all points in space, except for that single location it occupies.
2. Electric field lines originate on and point away from positive charges.  
Electric field lines terminate on and point toward negative charges.  
Electric field lines can originate OR terminate at infinity.  
The electric field lines enter and leave the charges symmetrically.
3. The number of electric field lines entering/leaving a charge is proportional to the magnitude of the charge.
4. The strength of the electric field at a location is proportional to the density of the electric field lines at that location (i.e. how close or how far away field lines are from one another)
5. Far away from a charge distribution, the electric field behaves as though it were produced by a single point charge that has a magnitude equal to the net amount of charge in the actual distribution.
6. Electric field lines NEVER, EVER, EVER, EVER, EVER, EVER, EVER CROSS!
7. The direction of the electric field vector,  $\vec{E}$ , is tangent to the electric field lines at each point.