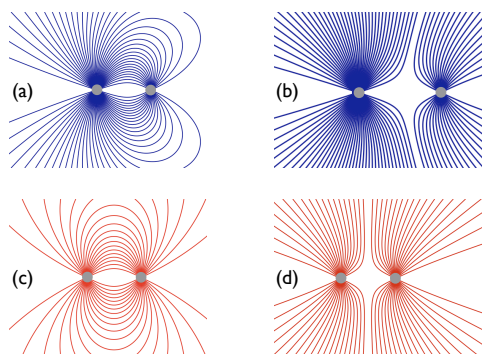


Quiz 2: Electrostatics

1. Two isolated identical conducting spheres have a charge of q and $-3q$, respectively. They are connected by a conducting wire, and after equilibrium is reached, the wire is removed (such that both spheres are again isolated). What is the charge on each sphere?

- $q, -3q$
- $-q, -q$
- $0, -2q$
- $2q, -2q$

2. Which set of electric field lines at right could represent the electric field near two charges of the *same sign*, but *different magnitudes*?



3. A “free” electron and a “free” proton are placed in an identical electric field. Which of the following statements are true? *Check all that apply.* Note the electron mass and proton mass above.

- Each particle is acted on by the same electric force and has the same acceleration.
 - The electric force on the proton is greater in magnitude than the force on the electron, but in the opposite direction.
 - The electric force on the proton is equal in magnitude to the force on the electron, but in the opposite direction.
 - The magnitude of the acceleration of the electron is greater than that of the proton.
 - Both particles have the same acceleration.
4. A point charge q is located at the center of a (non-conducting) spherical shell of radius a that has a charge $-q$ uniformly distributed on its surface. What is the electric field *for all points outside the spherical shell*?

- $E=0$
- $E=q/4\pi a^2$
- $E=k_e q/r^2$
- $E=k_e q/a^2$