

**Concept-Development
Practice Page****32-1*****Coulomb's Law***

1. The diagram is of a hydrogen atom.
 - a. Label the proton in the nucleus with a + sign and the orbital electron with a – sign.
 - b. The electrical interaction between the nucleus and the orbital electron is a force of (attraction) (repulsion).
 - c. According to Coulomb's law,

$$F = k \frac{q_1 q_2}{d^2}$$

if the charge of either the nucleus or the orbital electron were greater, the force between the nucleus and the electron would be

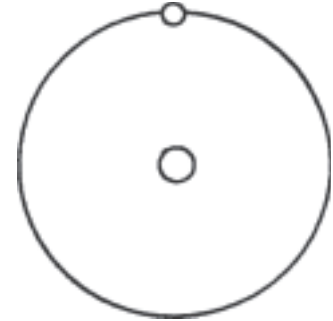
(greater) (less)

and if the distance between the nucleus and electron were greater the force would be

(greater) (less).

If the distance between the nucleus and electron were doubled, the force would be

(1/4 as much) (1/2 as much) (two times as much) (4 times as much).



2. Consider the electric force between a pair of charged particles a certain distance apart. By Coulomb's law:

- a. If the charge on one of the particles is doubled, the force is (unchanged) (halved) (doubled) (quadrupled).
- b. If instead the charge on both particles is doubled, the force is (unchanged) (halved) (doubled) (quadrupled).
- c. If instead the distance between the particles is halved, the force is (unchanged) (halved) (doubled) (quadrupled).
- d. If the distance is halved, *and* the charge of both particles is doubled, the force is _____ times as great.

