Physics II **Name** _____

Using Coulomb's Law **Period** _____ **Date** _____

1. If the distance between a proton and an electron is doubled, by what factor does the electric force each experiences change?

   What if the distance is tripled?

   Quadrupled?

2. This is about electric forces in a polonium nucleus.

   (a) What is the strength of the electric field produced by a $^{210}_{84}$Po nucleus at the surface of the nucleus? The radius of a nucleus is about 8 fm (8×10^{-15} m).

   _____

   (b) What is the magnitude of the electric force felt by a proton at the surface of such a nucleus?

   _____

3. In Neils Bohr's 1913 model of the hydrogen atom (pp. 773 ff.), the lowest orbit of the electron around the hydrogen has a radius of 5.3×10^{-11} m.

   (a) At that distance, what is the strength of the electric field of the proton?

   _____

   (b) What is the magnitude of the electric force experienced by the electron?

   _____

4. During one particular way among many in which the nucleus of uranium-235 fissions ($^{235}_{92}\mathrm{U} \rightarrow ^{89}_{36}\mathrm{Kr} + ^{144}_{56}\mathrm{Ba} + 2\ ^{1}_{0}\mathrm{n}$) there is a moment when the two daughter nuclei, krypton-89 and barium-144 are 20×10^{-15} m apart. At that particular moment,

   (a) how strong is the electric field produced by the barium nucleus at the location of the krypton nucleus?

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   (b) What is the magnitude of the force experienced by the krypton nucleus? Is it attractive or repulsive?

   _____

   (c) What is the magnitude of the force experienced by the barium nucleus?

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