Physics 30 Worksheet # 6: Coulomb's Law (1)

1. An object with a charge of 2.00 C is separated from a second object with the same charge by a distance of 1.50 m. What is the electric force acting between the charges? Is the force an attractive or repulsive force?

2. An object with a charge of 1.50 x 10⁻² C is separated from a second object with a charge of -2.50 x 10⁻² C by a distance of 0.500 m. Calculate the force acting between the charges. Is the force attractive or repulsive?

3. An electric force of 7.19×10^{-8} N acts between two charges, both of magnitude 2.00×10^{-10} N. Calculate the distance between the two charges.

4. Two identical charges are separated by a distance of 1.00 m. An repulsive force of 3.60 N acts between the charges. What is the magnitude of each of the charges?

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5. An electron and a proton are 5.29×10^{-29} m apart. Calculate the force that acts between them. Calculate the initial acceleration if the electron is free to move.

Calculate the initial acceleration of an alpha particle (q=3.20 x 10⁻¹⁹ C) if the alpha particle is 2.00 x 10⁻²⁵ m away from an electron and the alpha particle is free to move. Calculate the acceleration of the electron if it is free to move.

^{7.} A charge of 2.00 C is touched with a second charge of 6.00 C, then with a neutral object. The first charge is then separated from the second charge by a distance of 5.00×10^{-2} m. What is the electric force that acts between the first charge and the second charge.

^{8.} Object 1 has an initial charge of 1.00 x 10⁻⁵ C. Object 2 has an initial charge of -2.00 x 10⁻⁵ C. Object 3 has a charge of -3.50 x 10⁻⁵ C. If object 1 touches object 2, then object 2 touches object 3, then object 1 is brought 2.00 x 10⁻³ m away from object 3, what is the electric force that acts between charge 1 and 3?