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## Electrostatics WS 3: <br> Coulomb's Law and Charging Objects

1. A) What are the 3 ways that you can charge an object? B) Describe how to charge an object each way. C) For each method, tell me if you will wind up with one charged object, two similarly charged objects or two oppositely charged objects.
2. Calculate the magnitude of the force between two $3.60 \mu \mathrm{C}$ point charges 9.3 cm apart.
3. How many electrons make up a charge of $-30.0 \mu \mathrm{C}$ ?
4. What is the repulsive electrical force between two protons $5.0 \times 10^{-15} \mathrm{~m}$ apart from each other in an atomic nucleus?
5. Two charged dust particles exert a force of $3.2 \times 10^{-2} \mathrm{~N}$ on each other. What will be the force if they are moved to one-eighth as far apart?
6. A person scuffing her feet on a wool rug on a dry day accumulates a net charge of $-42 \mu \mathrm{C}$. How many excess electrons does she get, and by how much does her mass increase?
7. Particles of charge $+75,+48$, and $-85 \mu \mathrm{C}$ are placed in a line (see figure below). The center one is 0.35 m from each of the others. Calculate the net force on each particle due to the other two.

8. A charge of $6.00 \mu \mathrm{C}$ is placed at two diagonal corners of a square and the other two diagonal corners have a charge of $-6.00 \mu \mathrm{C}$ with the length of 0.100 m on a side. Determine the magnitude and direction of the force on each charge.

