Electrostatics Problems

1. Althea rubs two latex balloons against her hair, causing the balloons to become charged negatively with 2.0 x 10-6 C. She holds them a distance of 0.70 m apart. A) What is the electric force between the balloons? B) is it one of attraction or repulsion?
2. Two pieces of puffed rice become equally charged as they are poured out of the box into a cereal bowl. If the force between the puffed rice pieces is 4 x 10-23 N when they are 0.03 m apart, what is the charge on each of the pieces of puffed rice?
3. When sugar is poured from the bag into the sugar bowl, the rubbing of the sugar grains creates a static electric charge that repels the grains. If each of two sugar grains acquires a charge of 3.0 x 10-11C at a separation of 8.0 x 10-5 m, with what force will they repel each other?
4. Bobo the clown carries two mylar balloons that rub against a circus elephant, causing the balloons to separate. Each balloon acquires 2.0 x 10-7 C of charge. How large is the electric force between them when they are separated by a distance of 0.50 m?
5. Inez uses hair spray on her hair each morning before going to school. The spray spreads out before reaching her hair partly because of electrostatic charge on the hairspray droplets. If two drops of hairspray repel each other with a force of 9.0 x 10-9 N at a distance of 0.070 cm, what is the charge on each of the equally charged drops?
6. Bonnie is dusting the house and raises a cloud of dust particles as she wipes across the table. If two 4.0 x 10-14 C pieces of dust exert an electrostatic force of 2.0 x 10-12 N on each other, how far apart are the particles at that time?
7. Each of two hot air balloons acquires a charge of 3.0 x 10-5 C on its surface as it travels through the air. How far apart are the balloons if the electrostatic force between then is 8.1 x 10-2 N?
8. Two charges are separated by a distance of 2.00 km. One of the charges is 0.085 C and the force between the two charges is 8.64 x 10-8 N. Determine the magnitude of the second charge?
9. A charge of *q* is placed 3.39 m from another charge of magnitude 3*q* and they experience a force of 2.4 x 10-6 N, what is the value of *q*?
10. Suppose two clouds containing equal numbers of electrons are separated by a distance of 2.4 x 1022 m. If the electric force between the clouds is 1.0 N, what is the charge of each cloud?
11. If two charges of +2.0 nC and – 2.8 nC are separated by a distance of 1034 m, what is the magnitude of the electric force between then charges? If the distance between the charges were doubled, by what factor would the force change?
12. Two massive clouds each have a charge of 1.0 x 105 C and are separated by a distance of 7.0 x 1011 m. What is the electrostatic force between the clouds?