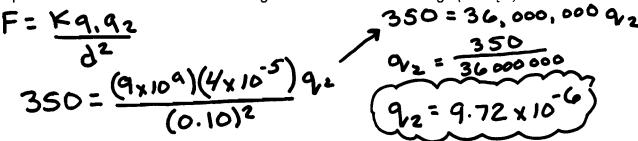
$$F = \frac{Kq_1q_2}{d^2}$$
 $K = 9.0 \times 10^9 \frac{Nm^2}{C^2}$ 1 $q = 10^{-6} \text{ C}$

Coulomb's Law Problem Set 1

 A sphere carrying a charge of + 2.0 ų C is placed 15 cm from a sphere carrying a charge of - .50 ųC. What is the force between the two spheres? (0.4 N)

$$F = \frac{KQ_1Q_2}{d^2} = \frac{(9\times10^9)(2\times10^6)(.5\times10^6)}{(0.15)^2} = \frac{0.40N}{AHraction}$$

2. A charge of 4.0×10^{-5} C is attracted by a second charge with a 350 N force when the separation is 10.0 cm. Calculate the magnitude of the second charge (9.72 μ C)



3. What is the magnitude of the charge on two equally charged spheres that exert a force on each other of 0.300 N when 75.0 cm apart? (4.33 y C)

$$9_1 = 9_2 = 9$$
 $0.30 = \frac{9 \times 10^9}{(.75)^2} = (16 \times 10^9) 9^2$
 $F = \frac{K99}{d^2} = \frac{K9^2}{d^2}$
 $9^2 = \frac{0.3}{16 \times 10^9} = 1.875 \times 10^9$

4. What is the distance between two spheres, each with a charge of 2.5 x 10⁻⁶ C, when the force between them is 0.50 N? (.335 m)

$$F = \frac{Kq_1q_2}{d^2} \implies F \cdot d^2 = Kq_1q_2$$

$$0.5d^2 = q_{x10}q(2.5 \times 10^6)^2$$

$$.5d^2 = 0.05625$$

$$d^{2} = \frac{0.05625}{.5} = 0.1125$$

$$d = \sqrt{0.1125} = 0.335 \text{ m}$$