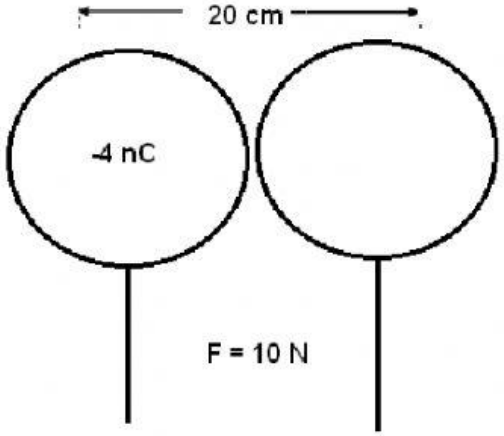
Electrostatics – Part 7

We can now calculate the magnitude of one charge if we are given the Force between the charges and all the information by manipulating the Coulomb's Law formula. Similarly, we can also calculate the distance between the objects if we are given the Force and the two charges. Try it!

12.1 Calculate the **magnitude** of the missing charge for the following questions



$$F = \frac{kQ_1Q_2}{r^2}$$

$$= \frac{9 \times 10^9 \times \quad \times Q_2}{(\quad)^2}$$

$Q_2 =$ C

Remember: No charge signs!

Don't forget to convert the distance to metres

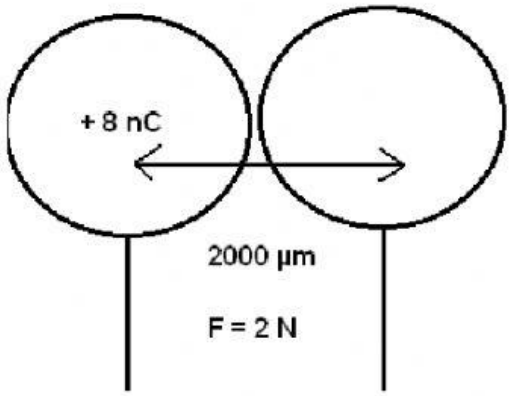
To rearrange the formula to solve for Q_2 you will need to calculate:

$$\frac{F \times r^2}{k \times Q_1}$$

Don't forget to SQUARE the r!!!

Write it out on a piece of paper if you need to and then just fill in the answer.

12.2

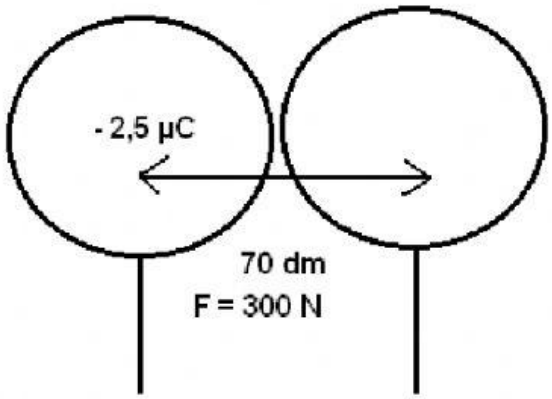


$$F = \frac{kQ_1Q_2}{r^2}$$

$$= \frac{9 \times 10^9 \times \qquad \times Q_2}{(\qquad)^2}$$

$Q_2 =$ C

12.3



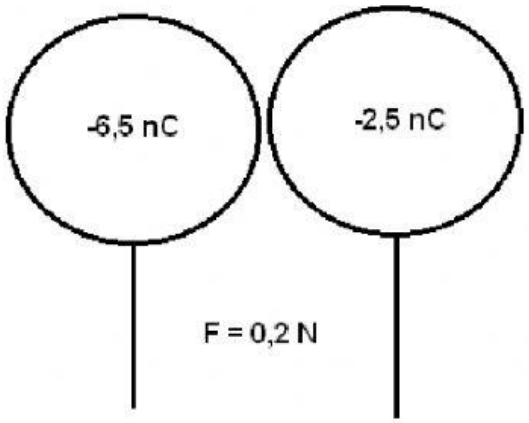
$$F = \frac{kQ_1Q_2}{r^2}$$

$$= \frac{9 \times 10^9 \times \qquad \times Q_2}{(\qquad)^2}$$

$Q_2 =$ C

13. Calculate the **distance, r,** between the charge's centres:

13.1



$F = \frac{kQ_1Q_2}{r^2}$

$= \frac{9 \times 10^9 \times \quad \times}{r^2}$

$r^2 =$

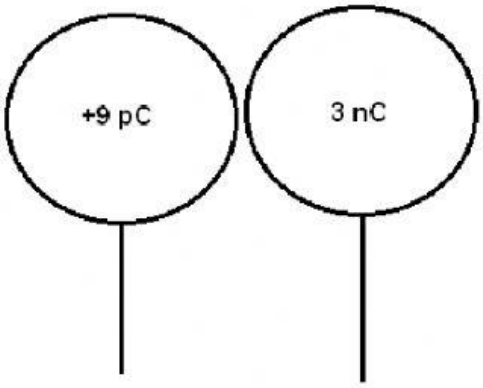
$r = \quad m$

To rearrange the formula to solve for r^2 you will need to calculate:

$$\frac{k \times Q_1 \times Q_2}{F}$$

Once you have calculated r^2, you will need to SQUARE ROOT this answer to get r.

13.2 The electrostatic force between the charges below is 0,4 N:



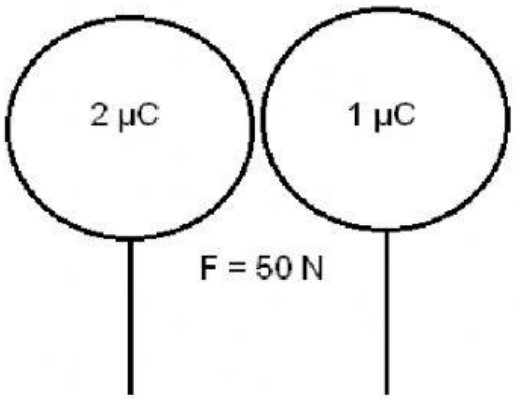
$$F = \frac{kQ_1Q_2}{r^2}$$

$$= \frac{9 \times 10^9 \times \quad \times}{r^2}$$

$r^2 =$

$r = \quad m$

13.3



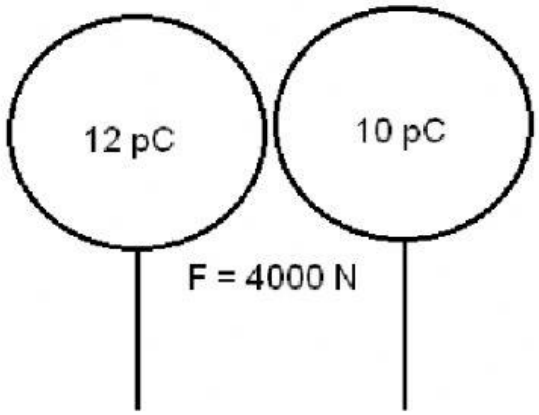
$$F = \frac{kQ_1Q_2}{r^2}$$

$$= \frac{9 \times 10^9 \times \quad \times}{r^2}$$

$r^2 =$

$r = \quad m$

13.4



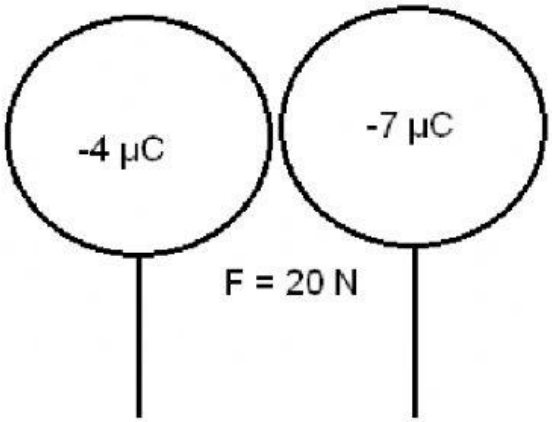
$F = \frac{kQ_1Q_2}{r^2}$

$= \frac{9 \times 10^9 \times \quad \times}{r^2}$

$r^2 =$

$r = \quad m$

13.5



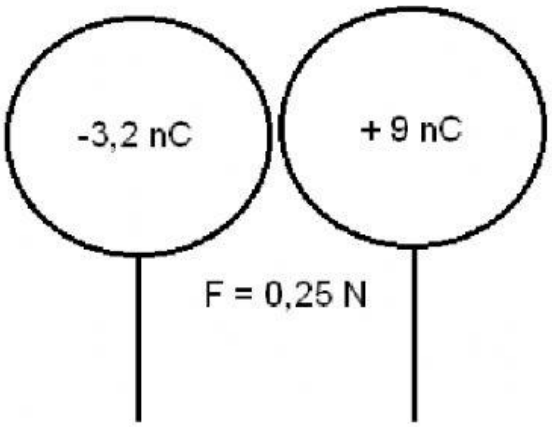
$F = \frac{kQ_1Q_2}{r^2}$

$= \frac{9 \times 10^9 \times \quad \times}{r^2}$

$r^2 =$

$r = \quad m$

13.6



$F = \frac{kQ_1Q_2}{r^2}$

$= \frac{9 \times 10^9 \times \quad \times}{r^2}$

$r^2 =$

$r = \quad m$