Coulomb's Law Enriched Notes

Def: _____

_____

Coulomb found the attraction between 2 objects depends on 2 things:

  1- _____
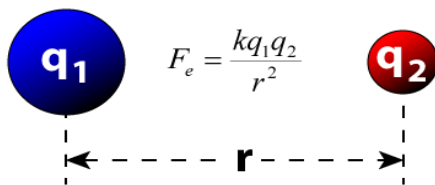
  2- _____

The stronger the charge the stronger the attraction will be, the greater the distance the weaker the attraction is.

Formula:
$$F_e = k\ \frac{q_1 q_2}{r^2}$$

Symbol	Stands for	Unit
k		
q_1		
q_2		
r^2		
Fe		

- q_1 and q_2 will be the same number unless specified in the problem.
- r often given in cm, must convert to m. ÷ 100
- k will always = to 9×10^9 regardless of the variable you are looking for.

$$q_1 \qquad F_e = \frac{kq_1 q_2}{r^2} \qquad q_2$$

$$\overset{\longleftarrow \text{ - - - - } r \text{ - - - - } \longrightarrow}{}$$

Looking for electrical force: Fe (unit N)
ex- 1- Two negatively charged spheres each with a charge of 4×10^{-7} C are placed 3 cm apart. What is the electrical force between the two spheres?

ex- 2- Two positively charged objects each have a charge of 5.0×10^{-8} C and are placed 1.0 cm apart. What is the electrical force between the 2 objects?

Looking for distance: r^2 (unit m)
ex- 3- Two positively charged particles at rest exert a force of 5.6×10^3 N on one another. The charge of the first particle is 6.0×10^{-5} C and the charge of the second particle is 2.0×10^{-4} C. What is the distance between the two charged particles?

ex- 4- Two positively charged particles at rest exert a force of 4.65×10^4 N on one another. The charge of the first particle is 7×10^{-5} C and the charge of the second particle is 5.55×10^{-6} C. What is the distance between the two charged particles?

Looking for charge of one object q 1 or 2 (unit C)
ex- 5- What is the charge of sphere 2, if sphere 1 has a charge of 5×10^{-4} C the distance between both is 0.004 m and the electrical force acting between both spheres is 4×10^4 N?

ex- 6
What is the charge of a sphere , if one of the spheres has a charge of 9.99×10^{-3} C the distance between both is 1.75 cm and the electrical force acting between both spheres is 4.855×10^7 N?