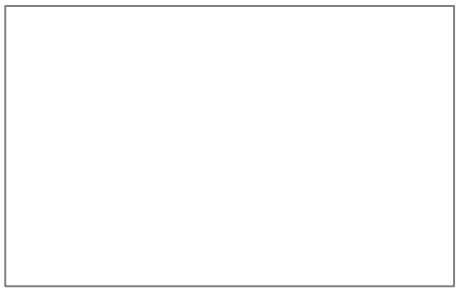
Force & Fields – Guided Notes

Coulomb's Law in words:

Coulomb's Law Equation:



F = _____

q_1 and q_2 = _____

d = _____

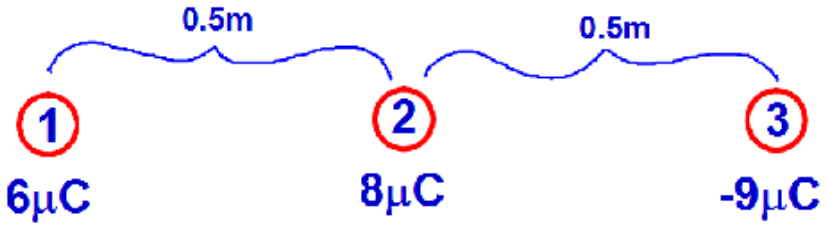
k = _____

How is Coulomb's Law similar to Newton's Universal Law of Gravitation?

Proton & Electron Simple Example Problem:

A proton and an electron are separated by a distance of 5.3 x 10^{-11}m. What is the force between the 2 particles?

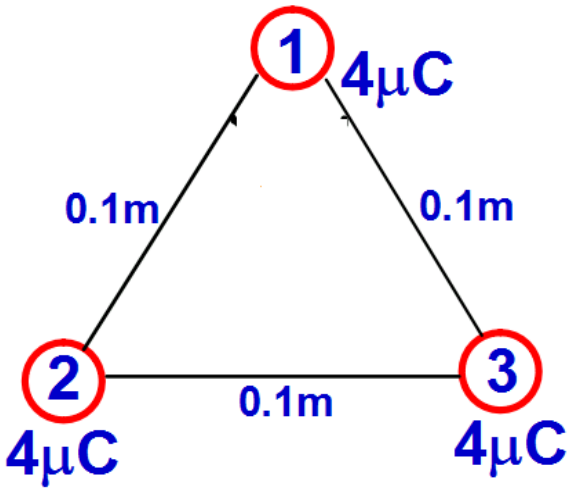
Charges in a Line Problem:



Q. What is the net force on charge 1?

Solution:

Triangle Charge Problem:



Q. What is the net force on charge 1?

Solution:

Draw Below the Example of a "Temperature Field":

Draw the electric field around a positive charge:

Draw the electric field around a negative charge:

The above are electric field VECTORS. What would they look like if instead we drew electric field lines?

Four Rules for Electric Field Lines:

1. Always come out of _____ and into _____ .
2. The closer the lines, the _____ the field.
3. Electric field lines never _____ .
4. Electric field lines should be drawn perpendicular to a surface.

So what is an electric field?

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The Equation for Electric Field (fill in the missing parts below):

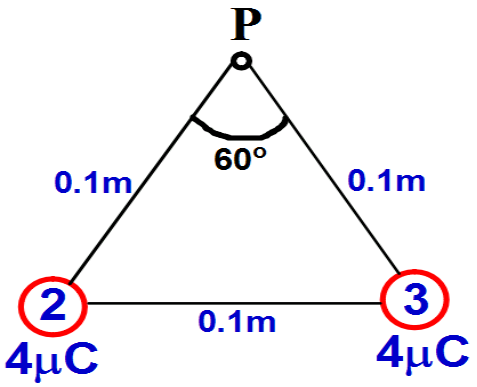
Electric field is the force that a +1 C test charge feels. So sub in 1 to the force equation.

This is the electric field around a charge q.

Electric field is the force a +1C test charge feels, so in other words it is the force felt per unit charge. (The force per Coulomb). That gives us another equation (definition) for electric field:

$$E = \frac{F}{q}$$

Multiple-Charges Electric Field Problem:



Q. What is the overall electric field at point P?

Solution: