Unit 1 You Tube Solved Examples

Coulomb's Law

Three charges q1 (1.00 μC), q2 (-2.00 μC) and q3 (3.00 μC) are held fixed on a horizontal plane: q1 at (-1.00; 3.00) cm, q2 at the origin and q3 at (2.00; 1.00) cm.
Find the net electric force that q2 and q3 exert on q1
YouTube: http://youtu.be/iLd38Yu8hqA

Electric Field of point charges

Two charges are held fixed on a horizontal plane: q1 (1.00 μC) is at (-1.00; 3.00) cm, and q2 (-2.00 μC) is at the origin.
Find the net electric field at point P3 (2.00; 1.00) cm
You Tube: http://youtu.be/4xuM8HN6Vms

Motion of a charged particle in an electric field

In a poorly aligned cathode ray tube, electrons enter a vertical uniform electric field with a velocity of 5.00×10^{7} m/s at 20.0^{o} above the horizontal.
The electrons hit the top plate, 1.00 cm up and 2.00 cm to the right from the place where they entered the electric field.
What is the magnitude of the electric field, and in which direction does it point?
YouTube: http://youtu.be/4aRUcVEgIAM

Drawing field lines, example 1

A positive charge 2.5Q is held on a horizontal plane and a positive charge of Q is held above (North) of it.
Sketch the electric field lines to represent the electric field around these 2 charges.
You Tube: http://youtu.be/LBr63hA4mww

Drawing field lines, example 2

A positive charge 2Q is held on a horizontal plane and a negative charge -Q is held left of it.
Sketch the electric field lines to represent the electric field around these 2 charges.
You Tube: http://youtu.be/mjQ6MJss_oI

Drawing equipotential surfaces, example 1

A positive charge 2.5Q is held on a horizontal plane and a positive charge of Q is held above (North) of it.
Sketch the equipotential surfaces around these 2 charges.
You Tube: http://youtu.be/64Pz33c8-sc

Drawing equipotential surfaces, example 2

A positive charge 2Q is held on a horizontal plane and a negative charge -Q is held left of it. Sketch the equipotential surfaces around these 2 charges.
You Tube: http://youtu.be/nQEgkZ8WyFs

Potential energy of point charges, example 1

A positive charge 2.00μC is held on a horizontal plane, a charge of -1.00μC is held 5.00 cm North of it, and a charge of 3.00μC is held 5.00 cm West of it.

a) What is the total potential energy of the system?

b) What is the potential energy of the 3.00μC charge?

c) If the 2.00μC charge is released (let's say the object has mass 1.00 gram), what is its speed when it is far, far away from the other 2 charges?

You Tube: http://youtu.be/jnzbv0oSY78

Potential energy of point charges, example 2

A small sphere carrying an unknown charge q1 is held fixed in space. A second small sphere of mass 1.00 mg, carrying charge q2 = 5.00 μC is projected toward q1. When q2 is 1.00 m from q1, its kinetic energy is 0.500 J. When q2 is 0.500 m from q1, its kinetic energy is 0.250 J.

Does q2 stop and turn around, or does it hit q1?

YouTube: http://youtu.be/bEnmo3qPdnI

Electric potential and potential energy of point charges, example 1

Charge q1 (-10.0 μC) is placed at the origin and charge q2 (1.00 μC) is at (3.00; -1.00) cm.

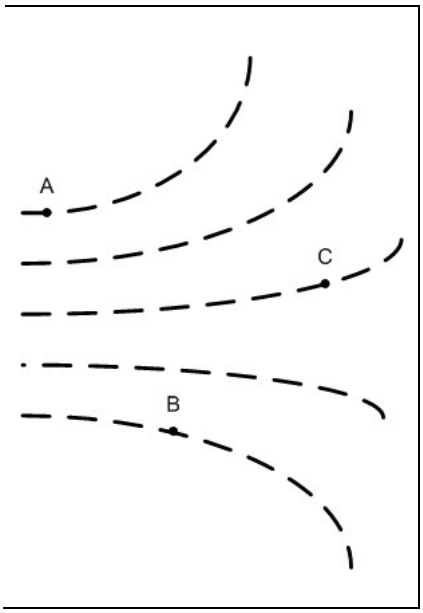
a) What is the electric potential at point P (3.00; 2.00) cm ?

b) Compare the potential energy of a 10.0 μC charge at point P with that of a -10.0 μC charge at point P.

You Tube: http://youtu.be/TXzS1NksFhQ

Electric potential and potential energy of point charges, example 2

A small object with mass 1.00 mg carries 3.125×10^{12} extra electrons. When it passes point A, it is moving at 14.15 m/s, and when it passes point B, it is moving at 10.0 m/s. Electric forces are the only ones acting on it.



a) Sketch electric field vectors at points A and B, and sketch an electric field line through point C.
b) What is the potential difference between points B and A (V_{BA}, V_B-V_A)?
c) If A is at 25.0 V What is the electric potential at B?

YouTube: http://youtu.be/Af7ZCXqtqzo