

tutorial #2 [electric potential, potential energy & capacitors] .quiz

Name:

1) Pieter van Musschenbroek tries to accelerate electrons using two plates connected to a voltage  $\Delta V = 10 \text{ kV}$ . Consider an electron released from rest at the negative plate and accelerates to the positive plate as shown in fig. 1.

- a) What is the potential energy of the electron at the negative plate? How about total energy?
- b) What is the potential energy of the electron when reaches the positive plate?
- c) Find the kinetic energy of the electron when reaches the positive plate. Calculate this energy in terms of eV.

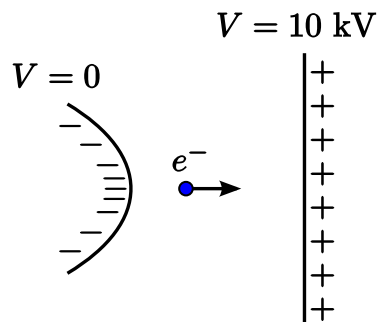


Figure 1: An electron between equipotential surfaces.

- 2) Robert A. Millikan slowly brings three same charges  $q = 1.0 \text{ nC}$  from infinity and put them on three vortices of an equilateral triangle with edges  $l = 1.0 \mu\text{m}$ .
- a) Find the potential energy of the configuration. How much work he did?
  - b) Answer part 'a' again if he brings four charges and put them on the vortices of a square with each side of  $l = 1.0 \mu\text{m}$ .