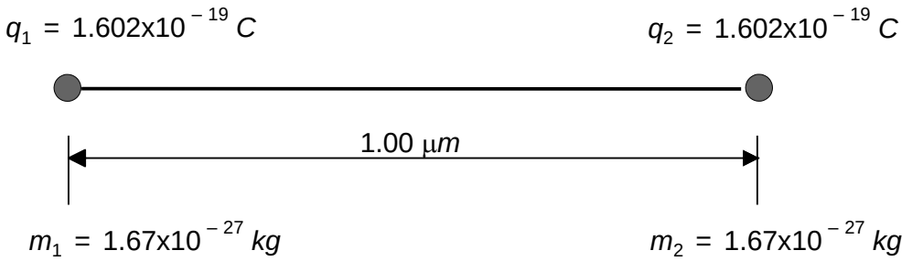
/19

Name : _____

Practice Quest – Fields (2018-05)

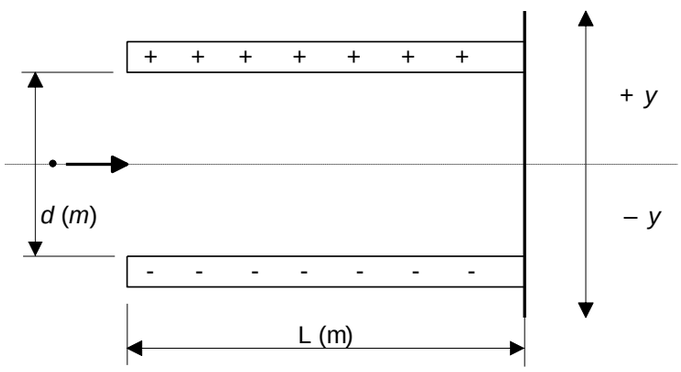
/7 1. Two hydrogen nuclei (recall a hydrogen nuclei consists of one proton) are placed 1μm apart as shown below (1 μm=1x10^{-6}m):



a. Calculate and compare the electrical and gravitational ***forces*** between the two hydrogen nuclei. How many <u>times</u> bigger is the electrical force to the gravitational force?

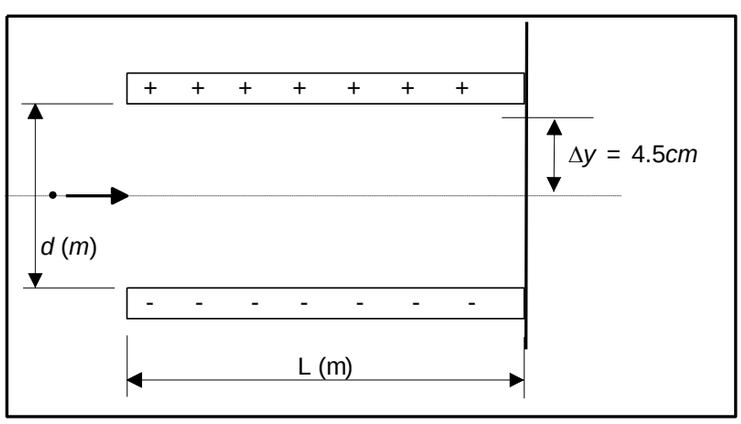
b. If an electron (q=-1.602x10^{-19}C) was place at the centre point between the two protons, what would be the overall force on the electron? What if the electron was place 0.5μm to the right of m_2, what would be the overall force on the electron?

/6 2. Calculate the vertical displacement of the particle as it moves through the electric field between two charged parallel plates .



Particle : <u>Electron</u> Mass = <u>9.11x10^{-31}kg</u> Charge = <u>-1.602x10^{-19}C</u> Starting Velocity V_h= <u>3.90x10^6 m/s</u>	Distance Between Plates, d= <u>0.20m</u> Length of Plates, L = <u>0.40m</u> Voltage Between Plates, V= <u>20V</u>

/6 3. Calculate the length of the plates (i.e. L in the diagram below) required to make the displacement of the electron equal to 4.5 cm given the parameters as outlined below.



Particle : <u>Electron</u> Mass = <u>9.11x10^{-31}kg</u> Charge = <u>-1.602x10^{-19}C</u> Starting Velocity V_h = <u>3.9x10^{6}m/s</u>	Distance Between Plates, d= <u>0.20m</u> Length of Plates, L = _____ Voltage Between Plates, V= <u>45.0V</u>