Example

- Find the repulsive force between 2 protons in a nucleus if their separation is 4.0×10^{-15} m and the charge of each proton is 1.6×10^{-19} C.

14.4 N

- Calculate the force of gravitational attraction between the 2 protons if the mass of a proton is 1.67×10^{-27} kg.

(use the separation value as above.)

1.16×10^{-35} N

Example

- A pair of equally charged particles A and B are placed a distance of 4.0×10^{-3} m apart and released from rest. The mass of A is 7.5×10^{-7} kg and B is 2.8×10^{-7} kg. If the initial acceleration of A is 6.0 ms^{-2} , calculate the

a.) initial acceleration of B

$16.1\ ms^{-2}$

b.) the common charge value.

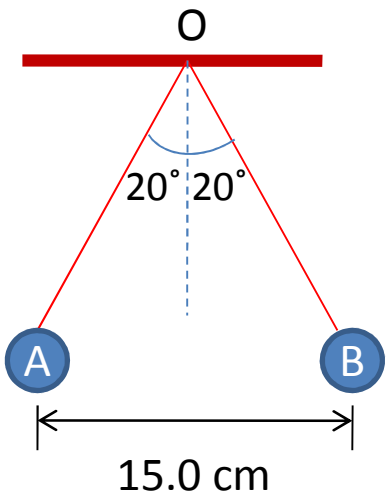
8.9×10^{-11} C

Example

- Figure shows 2 identical spheres A and B, each of mass 20g, suspended from a fixed point O on 2 insulating threads. The sphere are in equilibrium and each carries the same amount of charge, Q.

a.) Find the charge on each sphere.

4.22×10^{-7} C

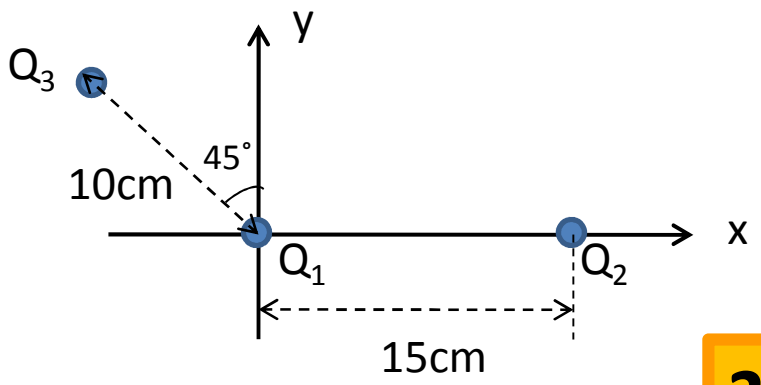


b.) Find the electric force acting on each sphere.

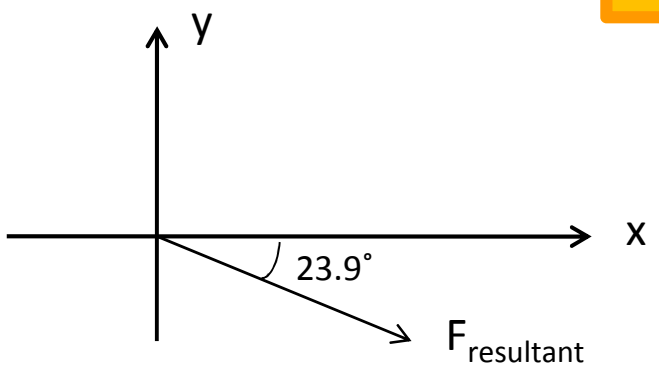
0.071 N

Example

- Figure shows 3 fixed charges Q_1= -1.0 x 10^{-6} C, Q_2 = 4.0 x 10^{-6} C, Q_3 = -2.0 x 10^{-6} C. Find the magnitude and direction (angle from x-axis) of the resultant force that acts on Q_1



Resultant force = 3.1 N



23.9° , clockwise from x-axis

Example

- Figure shows 2 protons separate from each other by a distance of 2.8×10^{-15} m. The charge on a proton is 1.6×10^{-19} C. Find the electric field strength E at the point

  a.) P, distance 0.8×10^{-15} m from proton A. **1.8×10^{21} NC^{-1}**

  b.) Q, distance 0.8×10^{-15} m from proton B. **2.3×10^{21} NC^{-1}**

  c.) R, distance 3.5×10^{-15} m from proton A & B. **2.2×10^{20} NC^{-1}**