Name: _____

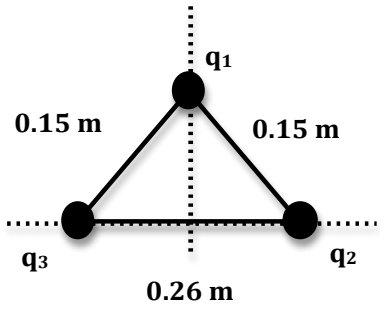
AP Physics 1: Electrostatics
Stations….

Station 1:
Two charges (q_1 and q_2) are place on opposite ends of a meter stick with charges q_1 = 2 C and q_2 = 3.5 C. Where could an electron be placed in between these two on the meter stick such that it remains in electrostatic equilibrium?

Station 2:
Two conductive spheres experience a repulsive force of 12.0 N when placed 1.06 m away from each other. Combined, these two charges have 80.0 μC between them. What is the charge held on each of the spheres?

Station 3:
Three small spheres are located at the vertices of an **isosceles triangle** with two sides each measuring 0.150 m and the third measuring 0.260 m. The triangle is cut completely in half by the y-axis. The values for the charges are as follows:

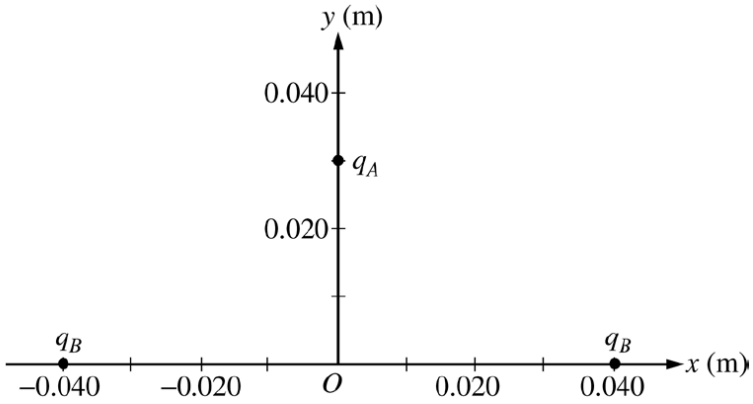
$q_1 = +4.00 \times 10^{-6}$ C $q_3 = -5.00 \times 10^{-6}$ C
$q_2 = +6.00 \times 10^{-6}$ C

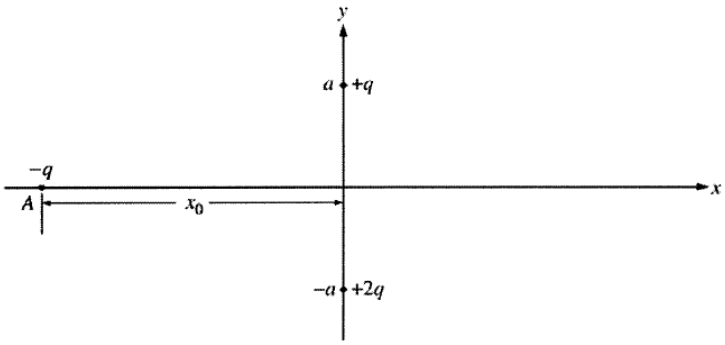


Find the magnitude and direction of the net force exerted on q_1.

Station 4:
Three particles are arranged on coordinate axes as shown. Particle A has a charge of q_A = –0.20 nC , and is initially on the y–axis at y = 0.030 m. The other two particles each have a charge of q_B = +0.30 nC and are held fixed on the x–axis at x = –0.040 m and x = +0.040 m, respectively.

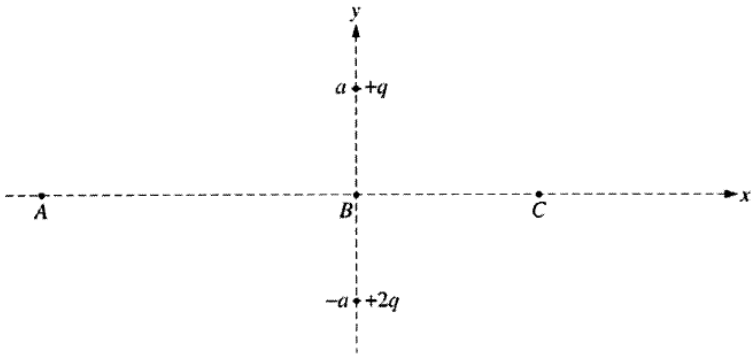
A. Calculate the magnitude of the net electric force on particle A when it is at y = 0.030 m, and state its direction.
B. Particle A is then released from rest. Qualitatively describe its motion over a long time.





Station 5:

A. Write expressions in terms of q, a, x0, and fundamental constants for the magnitudes of the forces on the –q charge at point A caused by each of the following.
   i. The +q charge
   ii. The +2q charge



B. The –q charge can also be placed at other points on the x–axis. At each of the labeled points (A, B, and C) in the following diagram, draw a vector to represent the direction of the net force on the –q charge due to the other two charges when it is at those points.