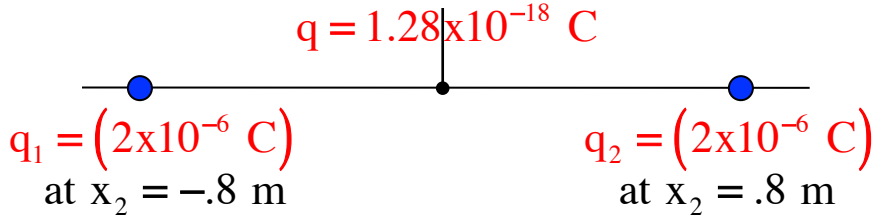
Problem 25.15

For the system of charges shown:



a.) What is the net force on q?

ZERO as the charges are equal and symmetrically placed.

b.) What is the electric field at the origin?

ZERO! The charges are equal and symmetrically placed, so they will produce electric fields of equal magnitude but opposite direction.

c.) What is the electrical potential at the origin?

Again, due to charge equality and position symmetry, the electrical potential created by one charge will be the same as that of the other, so:

$$V = 2k\frac{q}{r}$$

$$= 2\left(9x10^{9}\ N\bullet m^{2}/C^{2}\right)\frac{\left(2x10^{-6}\ C\right)}{(.8\ m)}$$

$$\Rightarrow \quad V = 4.5x10^{4}\ \text{volts}$$