Answer on Question #51173, Physics, Electromagnetism

Let the positive charge $q_1 = 2\,\mu C$ be on the left on the ox axis and negative charge $q_2 = -1\,\mu C$ be on the right. The distance between charges is $d = 20\,cm = 0.2\,m$.

The potential created by point charge at distance r from it is $\varphi = \frac{k q_1}{r}$, where $k = \frac{1}{4\pi\varepsilon_0}$ in SI system. Let the distance where the sum of the potentials created by two charges is zero be x (measuring the distance from positive charge). The potential created by positive charge at that point is $\varphi_1 = \frac{k q_1}{x}$ and created by negative charge is $\varphi_2 = \frac{k q_2}{d - x}$.

The sum of two must be equal to zero, thus $\varphi_1 + \varphi_2 = k\left(\frac{q_1}{x} + \frac{q_2}{d-x}\right) = 0$, or $\frac{(d-x)q_1 + x q_2}{x(d-x)} = 0$,

from where $x = \frac{-d\,q_1}{q_2 - q_1} \approx 0.133\,m = 13.3\,cm$.