Answer on Question #45688-Physics-Electromagnetism

A uniform electric field of $E = 200\frac{N}{C}$ is in the x-direction. A point charge of $q = 3C$ is released from rest at the origin. What is the kinetic energy of the charge when it is at x = 4 m?

Solution

The kinetic energy of the charge is equal to the work done by uniform electric field on a point charge:

$$K = W.$$

The work done by uniform electric field on a point charge is

$$W = qEd.$$

Thus

$$K = qEd = 3C \cdot 200\frac{N}{C}(4m - 0m) = 2400\,J = 2.4\,kJ.$$

Answer: $2.4\,kJ$.