

Answer on Question #46021-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.