Answer on Question #52174-Physics-Other

A uniform electric field of 200 N/C is in the x-direction. A point charge of 3μC is released from rest at the origin. What is the kinetic energy of the charge when it is at x = 4 m?

Solution

The potential at x is

$$V = -Ex.$$

The change in potential energy is

$$\Delta U = q\Delta V.$$

According to the conservation of energy law

$$KE = -\Delta U = -q\Delta V = qex.$$

Thus

$$KE = 3\mu\text{C} \cdot 200\frac{\text{N}}{\text{C}} \cdot 4\text{ m} = 0.0024\text{ J}.$$

Answer: 0.0024 J.