Charge density from 1-D electric potential distribution. In an electrostatic system filled with a homogeneous dielectric, of permittivity ϵ, the potential V is a quadratic function of x (and does not depend on other coordinates). The charge density, ρ, in the system is:

  (A) a linear function of x.
  (B) a quadratic function of x.
  (C) a cubic function of x.
  (D) a nonzero constant.
  (E) zero.

Solution: (D)
Answer: (D)