Obtain the expression for the electric field intensity of a point charge at the origin from its potential.

Solution:

$$\mathbf{E} = -\nabla V = -\frac{Q}{4\pi\varepsilon_o}\frac{d}{dR}\left(\frac{1}{R}\right)\mathbf{a}_R = \frac{Q}{4\pi\varepsilon_o R^2}\mathbf{a}_R$$

Answer:

$$\mathbf{E} = \frac{Q}{4\pi\varepsilon_o R^2}\mathbf{a}_R$$