Special Problem 4-6.8

A point charge of Q_1 is located at the **origin**.

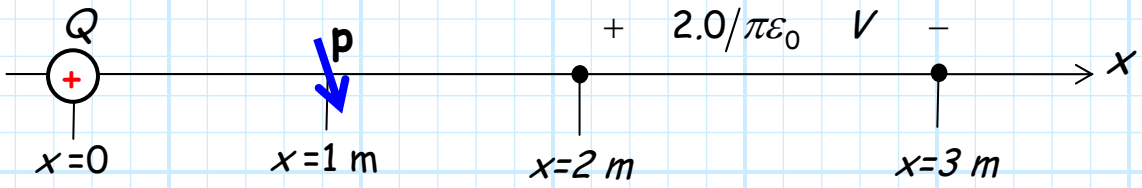
An electric dipole with moment $\mathbf{p}$ is located on the ***x*-axis** at x =1, where

$$\mathbf{p} = 2\,\hat{\mathbf{a}}_x - 3\,\hat{\mathbf{a}}_z \quad C \cdot m$$

These elements together produce a static electric field $\mathbf{E}(\bar{r})$.

Integrating this electric field along the x-axis from x = 2 to x = 3, we find:

$$\int_2^3 \mathbf{E}(\bar{r}) \cdot \hat{\mathbf{a}}_x \, dx = \frac{2.0}{\pi \varepsilon_0} V$$



Determine the value of charge Q